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THE

ECLECTIC REPERTORY,

AND

ANALYTICAL REVIEW,

Medical and Philosophical.

EDITED BY A SOCIETY OF PHYSICIANS.

......................Apis matinæ
More modoque.——Hor.

Nullis unius disciplinæ legibus adstricti, quibus in philosophiâ necessariò paremus, quid sit in quaque re maxime probabile semper requiremus.——Cic.

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J. Hartshorne

THE

ECLECTIC REPERTORY

AND

ANALYTICAL REVIEW.

Vol. VII. JANUARY, 1817. No. I.

SELECTED PAPERS.

On Rheumic Acid. By John Henderson, Esq. *Surgeon.*

[From the Annals of Philosophy, for October, 1816.]

To Dr. Thomson.

Lawton, Dec. 1, 1815.

Sir,

I MUST beg to be allowed a corner of your Journal for the insertion of a paper, the subject of which will, I trust, be interesting to some of your readers, when it is found to contain the history of a substance hitherto unknown in the chemical world; and though I am well aware that it may contain some inaccuracies, I am certain of its meeting with every necessary indulgence from those who are able to appreciate the difficulty of such an investigation.

Having for a long time remarked that, amongst the immense variety of vegetable productions, but a very few salts were peculiar to them, and being anxious to prove for myself that no others existed, I entered on the analysis of some of them, with as much care as circumstances would allow; and amongst other plants, I subjected to experiment that commonly called rhubarb, class *enneandria*, genus *monogynia.* I had two reasons for choosing this plant; the first was, that I conceived it

might contain a very considerable portion of the citric acid, and that this article might be more advantageously manufactured from it; and, secondly, that it might contain an acid peculiar to itself: and this idea, I was happy to find, was not altogether groundless.

Exper. 1.—Having expressed the juice of the stems of the rhubarb, first by beating them in a mortar, and afterwards passing the whole through a cloth, I put in gradually a quantity of powdered chalk, tasting the liquid now and then, till I found that the juice had lost every trace of acidity, and the liquor, from being clear and colourless, became cloudy. It was then allowed to settle for some time, when the supernatant liquor was carefully poured off, and pure water put in its place. The whole was then perpetually stirred, that the powder at the bottom might be completely washed. Again the water was cloudy; and the same was repeated till it was nearly pure. This, last of all, was drained off also; and in its place a quantity of sulphuric acid was added, diluted with twice or thrice its bulk of water.

A very strong effervescence, as may be supposed, took place, while the whole swelled to three times its former bulk, and at the same time a vapour issued, giving a sensation of smell like the concentrated juice of rhubarb, evidently showing that a part of the pure acid of the rhubarb was then in a state of vapour. When the acid was poured in a stream upon any part of the powder, it assumed a purple or black colour, as is the case in pouring sulphuric acid on phosphate of lime. While the effervescence continued, the mixture was frequently stirred, and afterwards was allowed to stand for twelve hours. The liquid part was then drawn off into a Florence flask, where it was evaporated to one-fourth, and set to crystallize. The first crystals formed were the most beautiful I ever saw; they were as white as snow, and shining like the crystals of benzoic acid. I had, however, to resort to a more accurate experiment to ascertain their form and properties.

Exper. 2.—8 lbs. of the stalks of the rhubarb were taken, deprived of their leaves, from which was obtained about a pint and a half of juice.

	lb.	oz.
The pint weighed	4	$4\frac{1}{2}$
Remaining juice	2	1
	6	$5\frac{1}{2}$
Ligneous remainder	1	7
	7	$12\frac{1}{2}$

$3\frac{1}{2}$ oz., therefore, were lost during the operation.

To this liquor $13\frac{1}{2}$ oz. of powdered chalk were added, until no taste of acidity could be perceived. Still, however, on the liquor being put to the test of tincture of litmus, the colour was instantly changed to red. Having found this for a considerable time after no acid taste could be perceived, I began to suspect that this test might be a fallacious one, on account of the water being by this time saturated with carbonic acid gas, which, I need not say, issued in bubbles from the chalk. I then ceased to put in more chalk, but after stirring it well, set it by to settle, and allowed it to stand 12 hours, when the liquor was drawn off, and a gray powder remained at the bottom, which was the rheumate of lime.

This powder was washed, as formerly, five or six times. Next day, on examining the fluid first drawn off, I was, I confess, a good deal surprised to find that it had assumed a blackish purple colour; and, what is singular, the same took place in every other experiment; therefore this was a liquid which possessed little or no colouring matter whilst its acid existed, whose colouring matter became evident on that being removed. This appearance, also, it must be mentioned, could not be owing to iron, for the liquid was contained in an earthenware vessel.

I was now very much puzzled regarding the exact quantity of sulphuric acid necessary to form a neutral sulphate of lime.

By analysis, sulphate of lime is composed of 32 chalk and 46 acid. But the specific gravity of chalk and acid are as 11 chalk : 7.5 acid, as 13.8. Chalk is to a fourth proportional 11: 7.5 :: 13.8 : 9.3; and by multiplying the third by 32, and

fourth by 46, the proportion is 427 : 415.14, or in nearly equal proportions. However, I found that a greater proportion of rheumate of lime was necessary to saturate the sulphuric acid; for 8 oz. saturated the whole $13\frac{1}{2}$ oz. I must here remark, that when the acid is poured on the chalk in a concentrated state, the gray powder is apt to get into lumps, and always turns of a blackish purple. Water was then added to the mass; and when the effervescence began, the smell of the rheumic acid was very agreeable, though too strong to be borne for any length of time. The liquor, after having stood for 24 hours, during which time it was repeatedly stirred, was drawn off, and put into shallow plates by the side of a regularly heated stove. I afterwards, however, found it convenient to make use of a hot-house; and after being evaporated to about $\frac{1}{4}$, they were set aside to crystallize, the liquor assuming a slightly red colour during evaporation. The crystals, as soon as formed, were taken out of the liquid, and dried in paper. The first formed were the whitest, and those constituted what chemists denominate *needle-formed* crystals, resembling nearest of any the crystals of benzoic acid.

The method I have chosen to prepare this acid, I am sensible, is on many accounts a difficult and laborious process; at the same time there is a very considerable quantity lost during the operation. It also contains a quantity of selenite; so that it is always necessary, in order to obtain it pure, to crystallize it a second time: but although it contains that foreign salt, when it is crystallized a second time, the form of its crystals are still the same. As I mentioned before, there is a considerable loss during the operation, which is owing to a property it has in common with the citric acid of being acted upon by sulphuric acid; and, therefore, when the evaporation has gone a certain length, the sulphuric acid becomes concentrated, and reduces the other acid to carbon, which is one of its ingredients; and I therefore allow that an easy method of preparing it remains yet to be discovered.

I once tried another method of preparing it, which, though it was not more successful, led me, however, to a conclusion which I conceive of no small importance. Instead of using

chalk in preparing the acid, I tried the effect of quick lime; when, in place of carbonic acid gas being given out, as formerly, *ammoniacal* vapours issued. This, as might be supposed, attracted my attention; but it was some time before I could acquire a satisfactory explanation of it. I at first thought that there might have remained a quantity of vegetable matter amongst the lime, and that, during the process of shaking, a part of the water was decomposed, while the vegetable matter, from the heat, gave out *nitrogen*, which attached itself to an atom of *hydrogen*. This was, however, a very doubtful explanation; and I afterwards altered my opinion, from some other circumstances; and I am now convinced that the rheumic acid exists in the plant under the form of *rheumate of ammonia*.

In an experiment I made some time afterwards, in order to prove whether any connexion existed between *this* acid and the *citric*, I added a quantity of mercury in its metallic state to a solution of rheumic acid, which was immediately acted on. I then tried whether the juice would act on mercury when assisted by heat; and I was happy to find this was the case. This induced me to try the same thing in other experiments; and at length I applied the juice in a concentrated state, which was done by evaporating it to dryness by the action of a slow fire. The mass thus formed was of a brown colour, with evident marks of crystallization. It was rather deliquescent than otherwise, and the taste was that of acid and salt, rather inclining more to salt. To this I added a small quantity of alcohol; and having mixed the whole together, the albumen was dissolved, and small crystals were deposited in the bottom of the vessel. These were taken and dried. They were found to resemble the salt commonly known by the name of *salt of lemons*. On being placed on a red-hot iron, they first swelled in the form of a pyramid, giving out at the same time certain *gases*, and afterwards there remained only a black coal. The same thing happens when pure acid is put upon a red-hot iron.

From certain experiments I made on the pure acid, I conceive it to be composed of 31 oxygen and 69 carbon. In this, however, I may be mistaken; for, from the apparatus I pos-

sessed, I could not perform any very delicate experiment. The last time I prepared any of the acid, instead of putting the chalk in the vessel containing the juice, I divided it into five equal portions, each of which was put into a separate vessel,

A part of the juice was then poured on No. 1; and, after standing some time, was drawn off into the one marked No. 2; and this was drawn off in the same way, first into No. 3, then into Nos. 4 and 5. When it came to the last, not the slightest mark of acidity could be perceived by the most delicate test. Another quantity of juice was then applied in the same way, till the whole was saturated. This plan I conceive to be far better than the first way of doing it; and I may at the same time also mention, that I at length extracted the juice, not only from the stems, but also from the leaves, by boiling them to a syrup.

I conceive there might still be another way of preparing this acid; which is, after dissolving a quantity of acetate of lead in water, to add a quantity of the juice of the rhubarb.

A white precipitate will then fall to the bottom, which must be allowed to settle, and the supernatant liquor be poured off. Then to this is added a quantity of *nitric* or *nitrous* acids; and when it has been allowed to stand some time, it is drawn off and evaporated, as in the foregoing experiments.

Dissolve the crystals, and then evaporate it a second time. The acid, when obtained pure, is soluble in about two parts of water, and is slightly deliquescent. It differs materially in its crystals from all the acids yet known, coming nearest to the *benzoic*; it is not, however, so flocculent, has not the aromatic smell, is more soluble, and of greater specific gravity.

There are four acids which it resembles in a few of its effects; it will, therefore, be necessary, before going further, to enumerate those properties which discriminate them from the acid now under our consideration.

These are the citric, oxalic, tartaric, and benzoic acids.

Citric Acid.

This acid forms beautiful rhomboidal crystals. Citrate of potash is very soluble, crystallizing with difficulty, and very

deliquescent. Citrate of soda has a saline taste; its crystals are that of a six-sided pyramid. The supercitrate of lime is a crystallizable salt, and is soluble in water.

Quicksilver is not acted on in its metallic state, but is readily acted on when in the state of an oxide. It forms small crystals, scarcely soluble.

Zinc is dissolved by it, and forms small brilliant crystals, nearly insoluble.

Oxalic Acid.

This acid is obtained in slender four-sided rhomboidal prisms.—The salts of the oxalic acid are scarcely soluble, such as oxalate of soda, which can scarcely be obtained in regular crystals. The oxide of mercury is dissolved, which forms a white powder that blackens on exposure to the sun.

Copper is dissolved by it, and a powder is obtained from their union of a pale blue colour, and scarcely soluble.

Lead, when digested with it, forms crystallized grains that are scarcely soluble, except when an excess of acid is used. With tin it forms prismatic crystals. Zinc is converted by it into an insoluble powder, which, however, becomes soluble on an excess of acid being employed. With the white oxide of arsenic, it forms prismatic crystals.

Tartaric Acid.

This acid crystallizes in prisms and pyramids. Tartrate of soda crystallizes in fine needles.

It combines with the oxide of mercury, and forms an insoluble compound. With tin it forms a white powder, and precipitates a solution of bismuth white.

It dissolves the oxide of antimony.

Benzoic Acid.

This crystallizes in soft flocculent crystals, which possess an aromatic smell, that is increased by heat. It is scarcely soluble in cold water. Benzoate of lime is soluble. Oxide of tin is not dissolved by it; but antimony is.

It would be needless to detail the differences between the rheumic acid and the other vegetable acids, as there does not exist the slightest resemblance between any of them.

Rheumate of Potash.

To a solution of the acid was added a small quantity of pure potash; and after the effervescence had ceased, I set it by to crystallize.

Small crystals were formed, but I did not ascertain their form. They had rather an acrid taste, and tinged bismuth green.

I confess I was considerably surprised, on adding the caustic alkali to the pure juice, to observe that, when it came to the point of saturation, the whole assumed a deep red or purple colour, at the same time that the albumen was precipitated of the same colour. After filtering the solution, I set it to crystallize. The crystals formed were red, but by washing they became transparent.

This salt is not deliquescent: it may, therefore, be distinguished from the tartrate, citrate, oxalate, and benzoate of potash.

Rheumate of Soda.

This salt I have formed, either by adding carbonate of soda to the pure acid, or in an impure way by adding it simply to the juice. In the latter way it has the same effect upon it as the pure potash has with regard to changing its colour, and precipitating a part of the albumen. When evaporated, it is obtained in the form of a four-sided prism. Of this, however, I was not quite certain, as those I chose for my examination were very irregularly formed. This salt is not deliquescent, and possesses alkaline qualities. It may, therefore, be distinguished from the citrate, oxalate, and tartrate of soda.

Rheumate of Ammonia.

This salt I have not yet examined.

Rheumate of Iron.

The concentrated or simple juice acts very readily on iron in its metallic state, especially if assisted by heat. It also acts on the carbonate and oxide of iron. The crystals thus formed are small, but I am not certain as to their exact form.

The carbonate of soda precipitates it of a gray colour; and, on the other hand, the rheumate of iron precipitates the acetate of lead. With the prussiate of potash a blue precipitate falls to the bottom; and with tannin it forms a blackish precipitate. When the acid is made to act on iron, it first converts it to a black oxide, and then dissolves it. It possesses rather a caustic taste.

Rheumate of Zinc.

The rheumic acid seems to have a great affinity for zinc. It acts very violently on it when in the state of the white oxide. The solution is of a straw colour; and when the carbonate of soda is added, it is precipitated of an orange colour. This salt does not crystallize. It possesses a very caustic taste; and, when added to the acetate of lead, a precipitation takes place. This, I suspect, is owing to a superabundance of the rheumic acid. It may be distinguished from citrate and benzoate of zinc.

Rheumate of Tin.

When the plain or concreted juice is boiled on tin foil, it forms first a darkish coloured oxide, and then dissolves it. When the juice is used for this experiment it turns of a blackish purple colour. If the pure acid is used, care must be taken that it contains no sulphuric acid.

When crystallized, it forms five-sided obtruncated pyramids. It may, therefore, be distinguished from the tartrate and benzoate of tin.

Rheumate of Antimony.

The rheumic acid has very little action on the oxide of this metal. However, it dissolves it in a slight degree, which may

be shown by chemical tests. Its crystals have not been examined.

Rheumate of Mercury.

This acid has a very considerable affinity for mercury, and acts upon it in its metallic state; even in the diluted way, it exists in juice. This was the first test that assured me it was different from the citric acid. On all its oxides it has similar effects, changing their colour before dissolving them.

The oxide of mercury may be again precipitated in the form of a yellow powder. In its crystals it exactly resembles those of water, shooting out in a most beautiful manner. They possess a shining appearance, and resemble in some measure the crystals of oxalic acid.

When exposed to the sun, they do not change colour. They may, therefore, be distinguished from oxalate of mercury, tartrate of mercury, and citrate of mercury.

Rheumate of Copper.

The rheumic acid dissolves the oxide of copper; and, when evaporated, it forms a powder of a dark green colour, which takes a considerable quantity of water to dissolve it. It may, therefore, be distinguished from oxalate and benzoate of copper.

Rheumate of Bismuth.

The rheumic acid dissolves the white oxide of bismuth very readily, and forms with it small crystals. It may, therefore, be known from tartrate of bismuth.

Rheumate of Arsenic.

This acid dissolves the white oxide of arsenic, and forms crystals of a pretty large size. They seem to be irregular cubes; and, therefore, can be distinguished from benzoate of arsenic and oxalate of arsenic.

Rheumate of Lead.

With this metal it forms an insoluble compound; and from

my observations I should conceive this to be one of the best tests of lead existing in any fluid.

I have not yet fully investigated the action of this acid upon the various earths. With lime, however, it forms an insoluble compound; nor does it become soluble when an excess of acid is added, as the supercitrate of lime does. It also dissolves magnesia and argile; but the crystals formed by these I have not yet examined.

The stronger acids, when distilled with it, have the effect of charring it.

I have now brought this paper to a conclusion; and though the investigation is still in its infancy, it may perhaps have the good effect of stimulating some one to prosecute this very curious, and, I may add, very useful subject.

J. HENDERSON.

History of a very fatal Affection of the Pudendum of Female Children. By KINDER WOOD, ESQ. Member of the Royal College of Surgeons, and Surgeon in Oldham. Communicated by Mr. Abernethy.

[From the Medico-Chirurgical Transactions, Vol. VII.]

THE disease, to which I wish to call the attention of the Society, has attracted so little the notice of medical authors, and is so extremely fatal, that I trust no apology is necessary for throwing together such remarks upon it, as have occurred from time to time in the course of my practice.

Of this affection I have seen twelve cases, all occurring in patients between one and six years of age: of these only two recovered, and they were the only cases in which my attendance was required early in the disease. My notes of these two cases have enabled me to describe the earlier appearances of the disease. The great rapidity with which it proceeds to an extent, which the tender constitutions of infants and chil-

dren are unable to support; the insidious manner of its first appearance; the similarity in its commencement to some ordinary affections of the parts; its novelty, for I have always seen parents more surprised than alarmed; all these circumstances contribute to that period being passed over, when alone medical means can be serviceable.

The commencement of this affection is attended with chilliness succeeded by heat; slight pain in the head, dulness, nausea, loss of appetite and thirst; the tongue has a clay-coloured deposit; the bowels are torpid, and the patient is languid, inert and listless. These symptoms precede the affection of the pudendum about three days. The patients first call the attention of parents more particularly to the seat of the disease by complaints of pain in voiding urine, or when too young this is observed by the cries and struggles of the child during the act of emptying the bladder. When the genital organs are examined, one or both labia are found inflamed and enlarged, the inflammation is of a dark tint, and soon extends internally over the clitoris, nymphæ and hymen; the pain in voiding the urine may induce a supposition that the inflammation extends into the urethra, and a thin secretion, which at this period may be observed coming from these parts, renders it not improbable that the lower part of the vagina may be affected.

From this period of the formation of the inflammation so rapid is the progress to ulceration, that scarcely twenty-four hours elapse before a number of small vesications forming within the labia, as well as externally, burst and form so many open surfaces which, quickly spreading into each other, form larger ulcers; this was the progress in one case, in the other the skin opened without any previous vesication. The thin discharge which the inner membrane secretes, is now mixed with the secretions from the ulcerations, and is dark coloured, peculiarly offensive, and copious, irritating the adjacent parts, and contributing to extend the disease along the perinæum to the anus, and to the inner part of the top of the thigh, contiguous to the labia. I have also seen the inflammation spread over the mons Veneris, and be succeeded by deep ulcerations progressively extending as long as life continued.

The pulse is quick and irritable after the inflammation commences, and, as the ulceration extends, the face becomes of a peculiar pallid hue, the skin having a very singular whiteness, which I have never seen absent after the ulcerations had formed. As the bowels are slow at this period, the opening remedies uniformly bring away dark, slimy and offensive stools; and in two or three cases I have seen aphthæ spread extensively around the anus, and over the perinæum, and most extensively in a case which I shall have occasion to detail.

The ulcerations in this affection are not of an equal depth, or appearance, but various in this respect, as well as in the state of the bottom, which in some places is foul as well as deep, in others superficial and sprinkled with small red granulations.

It may be easily conceived, that in such a state of the organs of generation, the pain upon moving the pelvis is excruciating; and hence the patients, when sufficiently old to consult their own ease, constantly lie upon the back with the knees bent and thrown open; this circumstance of pain being produced upon the least motion greatly aids the tendency to inaction in the bowels. There is a most important symptom arising from the extreme pain and tenderness of these organs, viz. a retention of urine, attended with its usual concomitants, tenderness and swelling of the abdomen; and this is so common as to require a vigilant attention, and a vigorous exertion of parental authority, to induce the patient to resort to a voluntary effort.

It has not appeared to me that this disease required any particular time to finish its course, this depending upon the vigour of the patient's constitution, and the original violence of the attack. From the time that the ulcerative action is completely established, the enlarged labia diminish, and the redness disappears, the ulcer successively extending over parts which had been inflamed. The character of the disease at this time is that of a deep, foul, and spreading ulcer, upon parts weakened by a peculiar inflammation, and a constitution injured and weakened by previous febrile symptoms. The external organs of generation are now progressively destroyed; the peculiar pallor of the countenance increases; the pulse be-

comes quick and weak; the appetite fails; the bowels become loose; the skin of the thighs hangs loose and flabby as in marasmus; the discharge from the parts increases and becomes more and more offensive, till the patient is worn out and expires.

But if this disease is early seen, and checked by the proper use of applications and remedies, the ulcerations clean and heal, but never without leaving the constitution debilitated and injured. After the sores are healed, there continues a copious yellow mucous discharge from the vagina and external organs, which hinders the patient from recovering strength, and keeps up a tendency to the recurrence of the disease, which I have twice seen, and which in one case proved fatal.

The duration of this affection is various: in one case the patient got better in twenty-three days, in a second she recovered in seventeen days; it is to be understood that we speak here of the original disease; the mucous discharge, unusual paleness, and general debility, continuing six or eight weeks; but these are only to be looked upon as the consequences of the original affection. It is not possible to say what may be the duration of a fatal disease, this depending on so many circumstances of violence, constitution, &c. which must necessarily influence the rapidity of the termination. Where the ulceration is deep and extensive I have never seen the patient recover. I have never seen the affection terminate in mortification but once; and in this case, which proved fatal, I was a spectator of the treatment, which consisted in the application of powerful stimulants to the parts affected. This treatment undoubtedly originated in an incorrect view of the disease, and under this plan the external organs tumefied largely, and the supervention of mortification soon completed its course.

The similarity of this affection to some of the more violent cases of intertrigo, or galling, is very evident in its commencement; but the intertrigo, when found near the organs of generation, commences in the deep space betwixt the labia and the thigh: whereas the affection here spoken of, uniformly commences on the anterior part of the labia, and extends internay over the parts contained within the fissura magna; after the

secretion begins to be copious, the adjacent parts, to which the matter is applied, assume the same actions, as the perinæum, anus, and top of the thigh. It is probable that Armstrong had seen some cases similar to the subjects of this paper, as may be gathered from his Essay on the Diseases of Children.

If any similarity can be traced betwixt the subject of this paper and any other described disease, I presume it is the erysipelas infantilis; but even here there are so many points of difference, that the identity of the two diseases can by no means be allowed. Dr. Underwood, whom I shall here quote, states that the erysipelas infantilis ordinarily attacks within "a few days after birth: it was remarked (says he) in the former edition, that it was thought never to appear later than the month; but I have since seen it in a child of two months old." The affection which is my present subject, I have never seen under one year old, but frequently from one year up to six years of age; the patients who recovered were five years and a half, and six years of age, and I shall presently quote another four years old. Dr. Underwood states that the milder species forms matter in a very short time. The formation of matter never takes place in the disease I describe, the inflammation runs early into ulceration, but never suppurates, matter only appears as the secretion from the ulcerated surface. Again, Dr. Underwood states that the more violent kind very often mortifies, whereas the disease I speak of rarely runs into mortification unless improperly treated, as in the case before attended to; and it may be well here to observe, that the chief stimulant used in the case as an application, was the ol. camphoræ, which increased all the symptoms; whereas Dr. Garthshore found "linen compresses wrung out of camphorated spirit, successful in checking the inflammation" in the erysipelas infantilis.

These may be thought sufficient points of distinction, but more will be found if we refer to the dissections of the two diseases. In the erysipelas infantilis "upon examining several bodies, after death, the contents of the belly have been frequently found glued together, and their surfaces covered with inflammatory exudation;" "in males the tunicæ vaginales have been sometimes found filled with matter, which has evidently

made its way from the cavity of the abdomen;" "in females the labia pudendi are affected in like manner, the pus having forced a passage through the abdominal rings." Now, in a case which I shall hereafter quote, the body having been inspected, "the abdominal and thoracic viscera were found to have been free from disease." The erysipelas infantilis attacks equally male and female infants, whereas the disease here spoken of attacks female children alone. I presume that the circumstances above stated will be sufficient to show that these diseases are distinct from each other; indeed, so far is any inflammatory affection of the contents of the abdomen from accompanying this disease, that the patient evidently sinks under the debilitating influence of a deep and spreading ulceration; and the organs of generation never exhibit any collection of matter, either as originally formed in their substance, or as the consequence of suppuration in the cavity of the belly. From all these considerations, it is not unreasonable to conclude the disease to be of a distinct and specific nature; its progress, its early termination in such deep and extensive ulcerations, the peculiar whiteness of the face which I have never seen absent, its being confined in its commencement to the organs of generation, and being preceded by its specific fever, all tend to confirm the opinion. Like to all other inflammations, which end in the early destruction of parts, this is attended with fever of a low kind; the pulse, which early in the disease is frequent and weak; the clay-coloured tongue, torpid bowel, and vitiated biliary secretions; the dull headache, langour and lassitude show this; the purple hue of the inflamed parts, and their early ulceration, with an aggravation of the symptoms, compel us to consider it as a disease of debility, and necessarily lead to the plan of cure.

In this disease, the first part of the treatment is to move the sluggish bowels; for which purpose a sufficient dose of the submurias hydrarg. with pulv. rhei, will answer best, and uniformly bring away dark-coloured and offensive stools. The affected parts should be frequently washed with the liquor plumbi acetatis dilutus, slightly aired, and poultices made with the same liquor, and soft bread, applied warm immediately

after the parts have been washed. The intention of these means is to sooth and diminish the inflammation, and they should be persisted in during the inflammatory action, and till the progress of the ulceration is checked, and even longer if tenderness, excoriations, or aphthæ, should affect the perinæum, or anus.

It will be necessary to commence the use of bark in decoction, as soon as the ulcerative action is commenced; I have commonly added the confectio aromatica with tinct. columbæ, and small doses of tinct. opii: during the use of these means, the bowels should be opened every second or third day; and a moderate use of red wine may be allowed.

In the latter part of the disease, when the tumefaction and redness are diminished, and the ulcerations stationary, I have found the ung. oxidi plumbi albi very useful.

When the bowels become loose, which they do in the latter stages, the elect. mimosæ catechu is of excellent service, as a warm and powerful astringent, increasing at the same time the dose of tinct. opii. When the bowels would bear the use of the bark in substance, I have often given it, and have often seen the plan render a spreading ulcer stationary, and protract the fatal termination, where the constitution had received an injury it was unable to repair.

There is one point of view in which a consideration of this disease is highly important. The instances in which parents, on behalf of children, bring forward individuals upon the charge of rape, are disgustingly frequent; and it can scarcely be doubted, that this disease has been frequently considered in court as evidence of violence and venereal infection; inflammation, ulceration and discharge having always had particular attention in a consideration of the evidence. That very erroneous conclusions may be drawn from a superficial inquiry into these symptoms, will be evident from the preceding observations. I subjoin the following case, which has not hitherto attracted sufficient attention, both as an illustration of this point, and an additional evidence of the existence of this singular affection.

"Jane Hampson,* aged four, was admitted an out-patient of the (Manchester) Infirmary, February 11, 1791. The female organs were highly inflamed, sore and painful; and it was stated by the mother, that the child was as well as usual till the preceding day, when she complained of pain in making water. This induced the mother to examine the parts affected, when she was surprised to find the appearances above described. The child had slept two or three nights in the same bed with a boy fourteen years old; and had complained that morning of having been hurt by him in the night.

"Leeches, and other external applications, together with appropriate internal remedies, were prescribed; but the debility increased, and on the 20th of February the child died. The coroner's inquest was taken, previously to which the body was inspected, and the abdominal and thoracic viscera were found to have been free from disease. The circumstances above related having been proved to the satisfaction of the jury, and being corroborated by the opinion I gave, that the child's death was occasioned by external violence, a verdict of murder was returned against the boy with whom she had slept. A warrant was therefore issued against the boy, but he had absconded, a circumstance which was considered as a confirmation of his guilt, when added to the circumstantial evidence alleged against him.

"Not many weeks however had elapsed, before similar cases occurred, in which there was no reason to suspect that external violence had been offered; and some in which it was absolutely certain, that no such injury could have taken place. A few of the patients died, though from the novelty and fatal tendency of the disease, more than common attention was paid to them. I was then convinced I had been mistaken in attributing Jane Hampson's death to external violence; and I informed the coroner of the reasons which produced this change of opinion. The testimony I gave was designedly made public, and the friends of the boy hearing of it, prevailed upon him to surrender himself.

* See Medical Ethics, by Dr. Percival. Note by Mr. Ward, of Manchester, page 231.

"When he was called to the bar at Lancaster, the judge informed the jury that the evidence adduced was not sufficient to convict him; that it would give rise to much indelicate discussion, if they proceeded on the trial; and that he hoped, therefore, they would acquit him without calling any witnesses. With this request the jury immediately complied."

CASE I.

On January 22d, 1815, I was desired to see Miss R. aged six years: she had complained three or four days of headache; had been chilly, and occasionally hot; she had been sickly, and taken little food; was dull, heavy, and languid. This morning she had complained of pain in making water: upon examination the pudendum was found inflamed; upon which I was called in.

The inner surface of the left labium was ulcerated, as well as the clitoris; the right labium was inflamed, and the whole parts tumefied, of a dark purple hue, not unlike some kinds of erysipelas; the mons Veneris was enlarged and enflamed; the perinæum was enflamed and covered with aphthæ, which also encircled the anus; the discharge was thin, copious, and offensive, and had inflamed the top of the thigh, where it had been suffered to remain. The face had a peculiar paleness; the bowels were slow; the pulse quick and weak; the appetite diminished; the tongue of a dull clay colour. She was thirsty, complained of chilliness, and was indisposed for motion. The liquor plumbi acetatis dilutus was ordered as a lotion, to be applied lukewarm; and poultices made up with the same fluid were directed. A decoction of bark was also given with confectio cardiaca.

By the use of these means, the enlargement of the parts gradually subsided, the foul bottom of the sores became red, after which the ointment of white lead was used, and the parts healed by the 14th of February, a space of seventeen days from the first attendance.

In this case the affection again returned, but was early cured by resorting to the same remedies. The patient frequently retained the urine twenty-four hours, the pain was so violent, and obstinately resisted every inclination to empty the bowels,

so that the opening remedies were obliged to be exhibited with a regular attention.

CASE II.

On the 25th of April, 1815, I saw Miss S. aged five years and a half. She had been unwell a few days previous to the 21st, when, complaining of pain in voiding the urine, the parts were examined and found slightly red; they were washed with milk and water, and dusted with the lapis calaminaris. On the 22d the inflammation had increased, and the parts were slightly excoriated. On the 23d a thick yellow discharge was observed, the patient was getting more unwell, the bowels were slow. On the 24th the open surfaces were enlarging, and small watery vesicles appeared upon the labia and perinæum; upon the left thigh also was a large cluster; the bowels were twice opened this day by some family purgative.

On the 25th I saw the patient, and found both labia enlarged, and of a purple redness, with numerous small watery vesicles, upon the external surface, and also within the fissura magna. They were similar to cowpock vesicles of the third and fourth day; were found also upon the perinæum, and the top of the left thigh. In some places the tops of the vesications were loosened, and showed beneath a deep foul ulcer, particularly in the cluster upon the thigh, and on the anterior part of the labia. The parts within the fissura magna were every where red and inflamed, and several small ulcers were found. The skin around the anus was painful and red; and the secretion was then copious and offensive. There was a dull headache, a quick and irritable pulse, a moist tongue, but bearing a clay-coloured deposit; the motions on the 24th were dark-coloured and offensive; the patient was considerably weakened, and the face of a peculiar paleness. I advised saturnine lotions slightly warmed, and saturnine poultices without oil, to the parts, and gave small doses of pulv. rhei in a saline mixture every three hours.

April 26. Fresh vesications still appearing; and when the tops of the earlier vesicles had come away, the parts beneath were deeply ulcerated. Several aphthæ were observed within the labia, upon the perinæum, and around the anus. The skin

was hot and dry; the bowels open, and motions dark and offensive; with excessive pain upon voiding the urine.

27th. The top is thrown off from the cluster of vesicles upon the thigh, as well as from the vesications upon the pudendum and perinæum; the open surfaces are deep and foul, secreting largely a thin and offensive matter; the anus surrounded with aphthæ; the pulse 120; skin hot and dry; bowels open, and urine excessively hot and painful. Ordered a decoction of bark, with the conf. cardiaca; recommended a little red wine to the patient, and to continue the applications to the parts.

28th. The bowels slow; the urine has been retained thirty hours; the abdomen tender and hard; with much difficulty she was prevailed upon to void the urine, which was copious, high coloured, and of a strong smell: the aphthæ had almost disappeared, and the diseased parts showed a large ulcer of various depths, extending over the pudendum and perinæum, down to the anus; the parts within the labia were in the same state, and a deep ulcer, but not extensive, lay upon the left thigh, on its upper and inner part; the secretion is thin, copious, and offensive. The sores were ordered to be washed with the lotion as usual, and dressed with the white lead ointment. Continue the bark mixture, and increase the wine.

29th and 30th. The ulcerations were stationary; the same means were continued; but as the bowels were slow, they were moved with an infusion of senna.

May 1. Sores improving; the bottom becoming less foul, and discharge less offensive; pulse 90 and weak; appetite poor; sits up a little; great inclination to retain the urine; bowels open. Continue the applications and remedies.

2d. The sores improving, as well as the strength. This state of improvement continued regularly, till the sores were healed on the 14th. After the healing, the pudendum continued discolored and tender, and a considerable mucous discharge continued with varying quantity for the space of six or eight weeks; this was relieved by a continued use of the tinct. lyttæ, bathing the parts frequently in the day with a solution of the sulphas zinci; the shower-bath was also used with the intention of checking the secretion, as well as getting up the strength.

I saw this patient on the 27th of June, when the discharge had ceased.

Upon looking over my notes, I find that, in nine years, I have seen twelve cases; of these, I have only seen the two above related so early as to be materially serviceable; the others being among the children of labourers, had little chance, either from the attention or punctuality of the parents, of getting over so very formidable a disease. One, a little girl of two years old, recovered, and was attacked again in the course of a fortnight, which second attack proved fatal. In a girl, five years of age, where the earlier appearances of the disease had been entirely overlooked, the mother upon finding an extensive ulcer, brought the child to me, under the idea of its having received injury from fire, which had escaped attention. The case proved fatal.

Observations on the Treatment of Varicose Veins of the Legs. By B. C. Brodie, Esq. F.R.S. Assistant Surgeon to St. George's Hospital, and Lecturer on Surgery.

[From the Medico-Chirurgical Transactions, Vol. VII.]

It seems to be established by the experience of modern surgery, that a mechanical injury inflicted on the trunk of one of the larger veins, is liable to be followed by inflammation of its internal membrane, and a fever of a very serious nature; and the occasional occurrence of these symptoms after the ligature, or even the simple division of the vena saphena, has occasioned surgeons to be cautious in performing these operations for the relief of a varicose state of its branches in the leg.

But are the same ill effects likely to take place if a similar operation be performed on the branches themselves? Reflecting on the following circumstances, I was induced to answer this question in the negative. Varicose veins of the legs are so frequent in persons of the inferior order, (at least in the metropolis) that it cannot be otherwise, than that a considerable pro-

portion of those who apply at the hospitals on account of wounds of the legs, must labour under this disease; yet I do not recollect an instance of venous inflammation following such an accident; neither has such an instance occurred among a great number of cases which have come under my observation, in which the varicose veins of the rectum forming piles, have been removed by excision or by ligature.

It was recommended by Celsus to destroy varices of the leg, by the cautery, or by extirpating them with the knife; and the same operations have been performed (though but seldom) by some more modern surgeons. The consideration of the circumstances, which have been just stated, led me to venture on the adoption of a practice somewhat corresponding (though not exactly similar) to that of Celsus. Finding that it was attended with benefit to my patients, and that no ill consequences ensued, I did not hesitate to repeat the experiment in a considerable number of cases. It is the result of my observations on this subject, which I have now the honour of laying before the society; not in the belief that I am communicating surgical facts of the first importance, but hoping, nevertheless, that what I have to mention, will be found not altogether undeserving the notice of the profession.

Where the whole of the veins of the leg are in a state of morbid dilatation, and the distress produced by the disease is not referred to any particular part; there seem to be no reasonable expectations of benefit, except from the uniform pressure of a well applied bandage. But, not unfrequently, we find an ulcer which is irritable and difficult to heal on account of its connexion with some varicose vessels; or, without being accompanied by an ulcer, there is a varix in one part of the leg, painful, and perhaps liable to bleed, while the veins in other parts are nearly in a natural state, or, at any rate, are not the source of particular uneasiness. In some of these cases I formerly applied the caustic potash, so as to make a slough of the skin and veins beneath it; but I found the relief which the patient experienced from the cure of the varix to afford but an inadequate compensation for the pain, to which he was subjected by the use of the caustic, and the inconvenience arising

from the tedious healing of the ulcer, which remained after the separation of the slough.

In other cases, I made an incision with a scalpel, through the varix and skin over it. This destroyed the varix as completely as it was destroyed by the caustic, and I found it to be preferable to the use of the caustic, as the operation occasioned less pain, and as (in consequence of there being no loss of substance) the wound was cicatrized in a much shorter space of time. I employed the operation, such as I have described it, with advantage in several instances; but some months ago I made an improvement in the method of performing it, by which it is much simplified; rendered less formidable, not only in appearance, but also in reality; and followed by an equally certain, but more speedy cure.

It is evident, that the extensive division of the skin over a varix can be attended with no advantage. On the contrary, there must be a disadvantage in it, as a certain time will necessarily be required for the cicatrization of the external wound. The improvement, to which I allude, consists in this: that the varicose vessels are completely divided, while the skin over them is preserved entire, with the exception of a moderate puncture, which is necessary for the introduction of the instrument with which the incision of the veins is effected. Thus the wound of the internal parts is placed under the most favourable circumstances for being healed, and the patient avoids the more tedious process, which is necessary for the cicatrization of a wound in the skin above.

For this operation I have generally employed a narrow, sharp-pointed bistoury, slightly curved, with its cutting edge on the convex side. Having ascertained the precise situation of the vein, or cluster of veins, from which the distress of the patient appears principally to arise, I introduce the point of the bistoury through the skin on one side of the varix, and pass it on between the skin and the vein, with one of the flat surfaces turned forwards, and the other backwards, until it reaches the opposite side. I then turn the cutting edge of the bistoury backwards, and in withdrawing the instrument the division of

the varix is effected. The patient experiences pain, which is occasionally severe, but subsides in the course of a short time. There is always hæmorrhage, which would be often profuse if neglected, but which is readily stopped by a moderate pressure made by means of a compress and bandage, carefully applied. The same pressure which is necessary for the suppression of the hæmorrhage, is useful, as it keeps the divided surfaces in contact, so that they may have the opportunity of uniting by the first intention. With a view to the more certain attainment of this last object, care should be taken not to divide very extensively the soft parts below the varicose vessels. If the edge of the bistoury be sufficiently sharp, a moderate pressure will answer the purpose required; and if the pressure be considerable, a wound much deeper than is necessary will be the consequence. With the same view, the patient should be kept for the first four or five days in bed, in a state of perfect quietude, and when the bandage which has been applied is removed, this should be done with the greatest caution, lest any union which may have taken place be destroyed, in consequence of the uniting substance not having as yet acquired the due firmness of texture. By attending to these circumstances, an immediate cure of the wound is generally effected: where it is otherwise, no very considerable time is necessary for it to become healed by the process of granulation.

In every case, in which this operation has been hitherto performed, I have found it to be followed by the obliteration of the varix, and, indeed, it is difficult to conceive how it should fail in producing this effect. Sometimes no vestige of the divided veins has been to be distinguished afterwards; at other times they have remained for a certain period full of solid coagulum, which has gradually been absorbed. This difference probably depends on the different degrees of pressure made by the compress and bandage, and on the circumstance of the pressure being confined to the line of the incision; or of its being extended over the whole cluster of dilated veins. If there have been veins in a varicose state below those, which have been divided, and communicating with them, these have become contracted in size, and usually have presented no

appearance of disease afterwards. The good effects of the operation have however been most apparent in cases of varicose ulcer. In most instances the pain in the ulcer has ceased immediately. When the ulcer has been of a moderate size, it has sometimes been found perfectly healed in a few days, on the first removal of the bandages;—when it has been of a large size, it has begun to heal rapidly, although it had made perhaps little or no progress towards amendment under the treatment which had been previously adopted. Where there has been a varix below the ulcer, the division of it has been attended with more relief than that of the varix above the ulcer in other cases.

Inflammation of the coats of the veins has not occurred in any of the cases, in which I have hitherto adopted this method of treatment. I have already observed that there are some reasons for believing that the venous branches are less liable to be inflamed, in consequence of mechanical injury, than the trunks, in which they terminate. But, perhaps, something is also to be attributed to the integuments over the wounded vein being left entire. It is not unreasonable to suppose that a vein under these circumstances is not equally disposed to take on the action of inflammation with one, which after its division is exposed to the contact of the air, or other extraneous substance. The difference of the injury corresponds to that which exists between a simple and compound fracture, and it seems probable that there should be, to a certain degree, a corresponding difference in the effects which are produced.

In two or three cases inflammation of the adipose and cellular membrane has taken place, producing pain and tenderness of the limb, and a slight degree of fever; but this has speedily subsided with only this ill consequence, that the wound has failed in becoming united by the first intention, and that the healing of it has been effected afterwards, by the more tedious process of suppuration and granulation. The treatment in these cases is very simple. Cold lotions may be applied in the first instance, for the purpose of moderating the inflammation. When the suppuration has begun, the parts may be fomented and poulticed, and the ultimate cure of the small

abscess which remains may be promoted by a moderate pressure made with strips of linen spread with soap cerate, applied circularly round the limb.

In two instances the operation has been followed by an attack of erysipelas; but this must be regarded as an accidental occurrence, there having been at the same time several other patients in the hospital, labouring under this disease.

Having made these general observations, I shall not intrude on the patience of the society, by giving a detailed account of the whole of the cases from which they are drawn. From those of which I have preserved notes, I have, however, selected the four following, the relation of which will be sufficient to illustrate the remarks which have been made, and to explain the circumstances connected with this subject, which principally demand the attention of the surgeon.

CASE I.

Mary Narraway, 45 years of age, was first admitted into St. George's Hospital, on the 12th of October, 1814; on account of pain, swelling, and ulcers of the legs, with many large clusters of varicose veins.

October 15. Two clusters of varicose veins, which were larger and occasioned more uneasiness than the rest, situated on the posterior part of the calf of the right leg, were divided with the skin over them, by two incisions. There was considerable hæmorrhage, which was stopped by the application of a bandage.

Some inflammation of the skin and cellular membrane took place after the operation, for which she was bled. The wounds made by the operation were not completely healed till after some weeks. She was then affected by an inflammation of the eyes, on account of which she remained in the hospital till the 17th of January. At this time there was no vestige of the clusters of veins which had been divided, and the veins of the right leg generally were much diminished in size.

She was re-admitted into the hospital on the 31st of January, 1816.

She said that her right leg had been completely relieved by

the operation, and that she had no uneasiness in it until three weeks ago; when a small ulcer took place on the inside, a little above the inner ankle.

At the time of her re-admission there was a very painful ulcer of the size of a six-pence, on the inside of the right leg, with some varicose veins above and below the ulcer. The whole of the posterior and outer part of the leg, from the cicatrix downwards, presented no appearance of varicose vessels, and was free from pain; but the pain in the ulcer on the inside was such that she could scarcely bear to stand in the upright position.

In the left leg there were the same clusters of varicose veins which had existed when she was in the hospital formerly, but somewhat increased in size, and a quantity of purple discoloured skin on the inside. She said that she had for a considerable time laboured under a painful varicose ulcer of this leg, which had at last healed under the use of the adhesive plaster.

February 10. The cluster of varicose veins above, as well as that below the ulcer of the right leg, were divided in the manner described in the former part of this communication; the skin over them being left entire. The division of the veins occasioned considerable pain, which subsided in about an hour and a half.

February 14. On removing the bandage the ulcer was found perfectly healed. She was free from pain. The wounds made by the operation had healed by the first intention.

March 4. There was still a slight tenderness in the situation of the wounds; otherwise she was free from all uneasiness. There were no remains of the varices, which had been divided.

CASE II.

Anne Sadler, 38 years of age, was admitted into St. George's Hospital on the 21st of August, 1815, on account of varicose veins of the left leg, with a varicose ulcer of the inner ankle. She complained of great pain on the inside of the leg, which tormented her day and night.

On the 17th of September two large varicose veins on the

inside of the leg were divided by means of the bistoury introduced obliquely under the skin. One of these veins was situated about an inch and a half above the inner ankle, and the other about four inches higher, on the inside of the leg.

The wounds made by the operation inflamed so as to suppurate, and afterwards healed by granulation.

In the beginning of October the wounds were completely cicatrized; the ulcer of the inner ankle was skinned over; no vestiges were perceptible of the veins which had been divided. She was free from all uneasiness, except a very slight degree of tenderness in the situation of the wounds made in the operation.

October 9. She was discharged from the hospital as cured.

CASE III.

William Haines, 52 years of age, was admitted into St. George's Hospital on the 6th of January, 1816.

He had two varicose ulcers on the inner ankle of the left leg, one of the size of a shilling, the other smaller. These ulcers had existed for two years, and were exceedingly painful. There was a considerable varicose vein below the ulcer, and another of a larger size above; extending upwards from the ulcers, to join the vena saphæna major. There were two clusters of varicose veins on the calf of the same leg, connected with both the saphæna major and saphæna minor; one of them of a very large size.

The veins of the other leg were varicose in many parts, but there were no ulcers.

January 13. The varicose vein below the ulcers of the left leg was divided in the manner already explained. The large varicose vein extending upwards from the ulcers was divided also, about three inches above the ankle.

The operation occasioned considerable pain, which lasted through the whole night.

January 14. He was more free from pain than he had been for a long time before.

January 18. The compresses and bandages applied at the time of the operation were removed. The ulcers were healed.

The wounds made by the bistoury had united by the first intention.

January 19. The larger of the two varicose clusters on the calf of the leg was divided.

January 24. The bandages were removed. The wound made by the last operation had also united by the first intention. The leg was bound up in strips of linen spread with soap plaster, and a bandage over them.

February 20. He left the hospital. At this time the veins of the right leg were in the same state as at the time of his admission. There were no remains of the veins which had been divided on the left leg: there was no vestige of the ulcers, and the discoloured skin round them had recovered its natural appearance. He was desired to continue the use of the bandage on both legs.

CASE IV.

Patrick Curley, 50 years of age, was admitted into St. George's Hospital on the 17th of January, 1816.

He had a varicose ulcer on each ankle of the left leg, not less than one inch and a half in diameter. There was an extensive cluster of varicose veins on the inside of the leg, above the ulcer of the inner ankle; and a smaller cluster on the outside, above the other ulcer. There was also a cluster of varicose veins on the calf of the leg. He had violent pain in both ulcers.

January 18. The varicose vessels on the inside of the leg were divided in three places, in the same manner as in the last case. The operation occasioned considerable pain, which lasted for four hours.

January 21. On removing the bandages, the incisions made in the operation were found to have healed by the first intention. The ulcers appeared more healthy. They were dressed with strips of adhesive plaster. He did not leave his bed until the 31st of January. He was now free from all uneasiness in the inside of the leg; but had a good deal of pain in the other ulcer.

February 20. The ulcer on the inside of the leg, below the

divided veins, was almost completely healed. The ulcer on the outside of the leg was somewhat, but very little smaller. He complained of its being very painful, so as to disturb his rest at night. Three varicose veins were divided above, and one below the ulcer. The pain of the ulcer was immediately relieved, and he slept better on the following night, than for several nights previous.

February 24. He was unfortunately seized with erysipelas affecting the whole of the left leg, and attended with the usual constitutional symptoms. The erysipelas terminated in abscess, the matter of which it was found necessary to evacuate by three punctures in the foot and calf of the leg. When the erysipelas had subsided, the ulcer on the inside had been completely cicatrized for a considerable time: the ulcer on the outside was nearly cicatrized also. There were no evident remains of the divided varicose vessels.

From the result of the foregoing and of many other cases, I am induced to conclude, that the operation which has been described, may be frequently employed with great advantage to the patient. At the same time I wish to be understood as recommending the adoption of it, not indiscriminately, but with a due attention to the circumstances of each individual case. The cases for which it is fitted, are, not those, in which the veins of the leg generally are varicose, or in which the patient has little or no inconvenience from the complaint, but those in which there is considerable pain referred to a particular varix, or in which hæmorrhage is liable to take place from the giving way of the dilated vessels, or in which they occasion an irritable and obstinate varicose ulcer.

On the Laceration of the Fibres of Muscles, particularly of the External Gastrocnemius. By JAMES WARDROP, Esq. F. R. S. ED.

[From the Medico-Chirurgical Transactions, Vol. VII.]

THERE is an accident to which the muscles are occasionally liable, and though not unknown to some surgeons, I am not aware has ever been noticed by surgical writers. As I have observed a few instances of it, perhaps a short account of them may not be deemed unworthy of being laid before the Society.

It sometimes happens that muscles during violent action tear asunder their tendons, and they have been known to break through the bones to which they are attached. In the injury now to be described, only a few of the muscular fibres are torn, and as far as I have been able to observe, the laceration is most apt to take place near the part where the muscle becomes tendinous. This description of injury is not confined to any particular muscles; it is an accident by no means unfrequent, and it appears to me that many of those anomalous injuries of muscles, and injuries which have been often attributed to the lacerations of tendons, as of the plantaris longus, are of this description.

Perhaps there is no muscle so liable to this injury as the external gastrocnemius, and it can occur in few where the symptoms are so strongly marked, or where a proper treatment is of such importance; the limits of this paper will therefore be confined to a description of the injury of this muscle.

When any of the fibres of the external gastrocnemius are torn, it will always be found to be the consequence of some untoward or sudden action of the muscle; and the attention of the patient is called to it, by suddenly feeling a sharp pain in some part of the leg, most commonly at that part where the fibres become tendinous, accompanied by lameness. When the limb is examined, an inequality will be perceived at the

pained part, a distinct concavity being formed by the separation of the lacerated extremities of the muscular fibres. This part is very tender to the touch, and though, in a short time after the accident, the whole calf of the leg becomes more or less swelled and tense, yet the particular part, where the muscle has been injured, can always be distinctly pointed out by the patient.

The consequences of this kind of injury are extremely troublesome; a very considerable swelling with tension of a part of the limb come on, and the patient remains quite lame. These symptoms continue with little abatement until means are adopted to keep the lacerated parts at rest, so that the accompanying inflammation may subside, and a re-union of the lacerated fibres take place; for whenever the patient begins to move about, the tender parts are stretched; acute pain is brought on, and he thus becomes more lame. In this manner I have known patients suffer from the injury for several months.

The cure of this kind of injury is sometimes extremely tedious, particularly if, from early inattention, the necessary treatment has been neglected. The lacerated extremities of the fibres should be placed as soon as possible in contact, and carefully retained in that situation until they adhere. This is to be accomplished by relaxing the whole muscle, and preventing its extension to such a degree as would separate the ends of the torn fibres, until adhesion has taken place. The foot should be moderately extended, and the knee slightly bent. A strip of linen should then be placed on the upper part of the foot, carried over the toes along the sole of the foot, heel, calf of the leg, and over the bend of the knee, and part of the posterior part of the thigh. This is to be secured in that situation by means of a circular roller, extending from the foot over the whole limb. The bandage is to be worn until the lacerated fibres are completely reunited; and this will be known from the patient's acquiring a feeling of strength, and being able to throw the muscle into action without pain or uneasiness. In some cases adhesion has taken place in a few days, when the proper treatment was employed speedily after

the injury. In other instances it has required several months before the limb could be used.

The symptoms and treatment of this injury may be farther illustrated by narrating the following cases.

CASE I.

A gentleman, when going across a street, stopped quickly to avoid a carriage. At this moment he had a sensation in the calf of his left leg, as if it had been struck with a stone, or by some very hard body swinging in his pocket; and so strongly was he impressed with this feeling, that he was surprised, when putting his hand into his pocket, to find it empty. This happened late at night, and I saw him early on the following morning. The posterior part of the limb had by this time swollen considerably. At the spot where he first felt the pain, there was a great degree of tenderness to the touch, and it was unequal and knotty to the feel, with a distinct depression at one part. Any motion of the limb gave pain, and he was unable to rest the weight of the body upon it.

The limb was bandaged in the manner which has been described; and from being lame and unable to move without great uneasiness, he could put his toes on the ground and exercise that limited motion which the bandage admitted of, without pain. The swelling and tenderness of the limb abated daily, and in less than a fortnight he was able to use it freely without the bandage.

CASE II.

A muscular man, 40 years of age, when quickly running across a street, felt, to use his own expression, as if he "was shot on the leg." He became quite lame, and complained of acute pain at that part of the calf of the right leg where the muscular and tendinous fibres of the external gastrocnemius muscle unite. A good deal of swelling succeeded, and I saw him eight days after the accident. He was then very lame, complaining of pain in the calf of the leg, where a distinct inequality or depression could be perceived, and there was a

good deal of discoloration of the whole inferior part of the limb.

A bandage was applied in the usual manner; the pain and swelling subsided; and in ten days he was walking about with only a very slight lameness.

On the use of Nicotiana, in retention of urine. By HENRY EARLE, Esq. Surgeon to the Foundling Hospital.

[From the Medico-Chirurgical Transactions, Vol. VI.]

THE following observations on an efficacious mode of relieving some of the most alarming cases of retention of urine, will not, I trust, be devoid of interest to the Society; when the frequency of the complaint, and the difficulties which occasionally occur in the treatment of it are considered.

The facts in illustration of the practice are not numerous, but sufficient to warrant my laying the subject before the public, to be confirmed or confuted by subsequent experience.

The causes of retention of urine are so various, that it is not my intention to enter at large into the subject; more especially as the plan of treatment which I shall speak of, is only applicable to particular cases: I shall therefore confine myself to a brief consideration of the nature of such cases.

It is well known, that persons who have been long subject to strictures in the urethra, but who are still able to void their urine in a small stream, are liable, from accidental causes, to have a complete retention, and are incapable of expelling the contents of their bladder. This arises in some cases from the calibre of the urethra being still further diminished by attacks of inflammation, but more frequently from the spasmodic state of the muscles of the urethra.

The same effect may be produced in persons labouring

under stricture, by retaining their urine beyond the usual period for expulsion. Even in a state of perfect health, if we suffer the bladder to be over distended, whereby the muscular fibres are stretched beyond their natural sphere of contraction, every one has experienced that a greater effort is required, and the aid of the abdominal muscles is obliged to be called in, to overcome the resistance afforded by the neck of the bladder. This, I conceive, arises from the disturbance of that nice equilibrium which naturally exists between the expelling and resisting power. When disease has existed for some time in the urethra, and a permanent obstacle is afforded to the egress of the urine, the expelling power is exerted with greater force: the bladder consequently becomes thicker, more muscular, and contracts on a smaller quantity of fluid.

It happens not unfrequently, that the permanent stricture may be of such a nature as not to admit of the introduction of any instrument into the bladder, even under the most favourable circumstances. I need scarcely add, that a spasmodic state of the urethra would not facilitate such attempts. Other cases again occur, in which perhaps an instrument can be passed, when the urethra is in a more tranquil state, but where it would be highly injudicious, and often impracticable to introduce such instruments under circumstances of irritation, by which attempts the spasm would be increased, and the patient rendered liable to returns of retention, were we to succeed in the first instance.

In all such cases it is highly desirable to overcome the retention by other means than the introduction of instruments. For this purpose purgatives, general and local bleeding, warm baths, and tinctura ferri muriatis are commonly resorted to. With respect to purgatives, their action necessarily requires more time, than, from the urgency of the symptoms, is frequently admissible. The other remedies are highly useful, and will frequently fulfil every indication; occasionally, however, they are unavailing, and we are compelled to resort to operations for relieving the distended bladder.

In offering another powerful auxiliary to be adopted in cases which have resisted the ordinary means employed, I hope to

confer some benefit on society. The medicine to which I allude is the Nicotiana, to be exhibited as an enema, in the form either of smoke or infusion.

The powerful effect of this medicine in strangulated hernia, first led me to propose its administration in obstinate cases of retention of urine, in a paper on diseases of the urethra, which I drew up some years since for a Medical Society. I shall now proceed to relate the cases in which I have had an opportunity of ascertaining its effects.

In October, 1812, I was requested to attend Charles Wright, for a retention of urine, of which he gave the following history. When about eighteen years of age, he had suffered severely from gonorrhœa and hernia humoralis; from this period he dated the complaint in his urethra. He was now thirty-five: during this time he had been in a gentleman's service, as groom, and had been obliged to ride a great deal. The stream of water gradually diminished in size, accompanied with frequent and urgent calls, until about two years before the present period; when, from being obliged to remain a long time on horseback, he had a retention of urine, accompanied with so much inflammation, that an abscess formed in the perineum, which burst and became fistulous. For this complaint he had been for some time under a surgeon's care, who attempted to pass bougies, but never succeeded in reaching the bladder. He had latterly been in the habit of passing a metallic bougie for himself, which was the probable cause of the present retention and inflammation.

On examination, I found a firm obscurely elastic tumour, about the size of a pigeon's egg, situated immediately on the urethra, at the lower part of the scrotum. This was about the point to which he had been accustomed to pass the instrument. The surrounding scrotum was healthy, which led me to refer the present abscess rather to the irritation of the bougie, than to any effusion of urine, which generally diffuses itself more extensively. The abscess had been about three days in forming, accompanied by great pain and fever, and he had not been able to void his urine for the last eighteen hours. I immediately made a free incision into the abscess, and let

out about ℥iv. of very fetid pus. I directed him to sit in warm water, and ordered a common clyster to be thrown up. As he was still unable to make water after the trial of these means, I desired him to take fifteen drops of tinctura ferri muriatis every ten minutes, in barley water. He continued it for nearly three hours; the medicine produced nausea and headache, but still no water passed. I now attempted to introduce a bougie, but could not get beyond six inches; the introduction thus far was productive of great pain. His symptoms were now very urgent, for although the bladder was not greatly distended, yet from the long existence of disease it had probably become much thickened, and was very irritable. Apparently no alternative now remained but an operation; and as the bladder could not be satisfactorily felt above the pubes, and the perineum was much thickened and diseased, I determined in my own mind to puncture from the rectum. Previous, however, to resorting to this *ultimum remedium*, I was desirous of trying the effect of the Nicotiana.

With this view I procured some common tobacco, and not having any scales was obliged to guess at about two drachms, on which I poured a pint of boiling water. Eight ounces of the infusion were thrown up, and with some difficulty retained. After about ten minutes the patient became very faint and sick; a clammy sweat broke out over his whole body, his pulse became feeble and intermittent, and the urine began to dribble away to a considerable amount. The contents of the rectum were now suffered to come away, consisting of the infusion mixed with fæculent matter. As he still continued very faint, a small quantity of brandy was given, which quickly restored him. The effect of the Nicotiana in this instance was most decidedly beneficial, though the symptoms produced were certainly alarming, arising probably from the uncertain strength of the infusion. I continued to attend the patient for some time; the abscess in the scrotum was unconnected with the canal of the urethra, and healed without difficulty. After some days I commenced passing bougies; at first I could not get beyond six inches, but by a few applications of the caustic, I succeeded in passing a tolerable sized one about eight inches.

The fistulous opening in the perineum I laid open, and by a compress and sticking plaster, effectually prevented the further escape of urine. He was in every respect much relieved, and there was a good prospect of his ultimate recovery, when he was obliged to leave London, and I have never since heard of him.

The next case in which I tried tobacco, occurred about three months after, in a gentleman who had been for many years subject to strictures, and for want of proper medical assistance, had suffered the disease to proceed to a most alarming extent. When he first applied to me, he declared that he had not, for a long time, been able to sleep for the space of one hour, and he was frequently obliged to make water every quarter of an hour. His general health was much impaired by want of rest, and the continual irritation under which he laboured. Generally the water came away in a fine hair stream, but at times it passed *guttatim*. On examining his urethra, I found a stricture about four inches down, which I passed with a small bougie, but could not succeed with the finest in getting beyond six inches. After several ineffectual trials with common and catgut bougies, it became necessary to resort to the caustic. After six applications he was attacked with a retention of urine, accompanied with great pain and anxiety. All the common remedies were in turn resorted to: he was bled, clystered, placed in a warm bath, and took the tinctura ferri muriatis, but all failed in producing the desired effect. The success I had met with in the last mentioned case led me to resort again to the Nicotiana; an infusion of the strength of one drachm to eight ounces was made and thrown up. In about a quarter of an hour he became rather faint and complained of languor, and in a few minutes more the water began to flow from him. The effect of the medicine in this case was by no means so violent as in the former, but equally efficacious.

As I had evidently gained ground with the argentum nitratum, I again resorted to it, and after applying it thirty-five times, by cautious perseverance I succeeded in reaching the bladder, and freed my patient from all his sufferings. During

this period he was at two several times again attacked with retention, and was relieved by the tobacco infusion, to which I at once resorted, without subjecting him to the delay of other medicines.

The third case occurred in the course of last summer: I was sent for to attend a young man labouring under retention of urine. I found that he had been for years subject to strictures, but had always been able to void his urine until that morning; when, on rising, he was unable to discharge the contents of his bladder. He had been in the habit of passing a small whalebone bougie, which he now attempted in vain to introduce. He called on a neighbouring apothecary, who immediately attempted to pass a catheter, and used great force, which was followed by a copious flow of blood, but no urine. He was next bled from the arm, and some opening medicine was administered, and as he was still unable to make water, I was called in.

I saw him about three o'clock in the day, the retention having existed from the preceding night. He was still bleeding freely from the urethra, and had a most urgent desire to make water. I directed him to take the tinctura ferri muriatis, and to sit in a tub of warm water. He took 18 doses of the tincture without any perceptible effect but nausea. I now attempted to pass a bougie, but when about eight inches down it quitted the right tract and was readily detected, by introducing the finger per anum, passing between the bladder and the rectum. I immediately withdrew the bougie, which had caused much pain, though introduced with the utmost care and gentleness, and ordered an infusion of Nicotiana, of the strength of one drachm to eight ounces, to be used as an enema.

I was under the necessity of leaving him, to visit a patient a short distance from town, but on my return, in less than two hours, I was informed that a short time after the injection he had been very faint, and had perspired copiously, during which time the urine flowed from him in a stream.

I directed him to keep quiet, and, whenever he made water, to press with his hand on the perineum, to prevent, if possible, the escape of any urine by the false passage: he had no re-

turn of the retention, and by the above precaution had no effusion of urine. It is most probable that in this case the retention was kept up, and symptoms aggravated by the injudicious introduction of the catheter in the first instance, without resorting to any other means. As the urethra had been pervious to the passage of urine the preceding night, it was evident that the complaint depended on spasm, which might have been relieved by warm bathing, or the cautious introduction of a bougie. Should such a case occur to me in practice, I should be induced to try the injection of warm olive oil into the urethra, as I understand that this plan has been very successfully adopted in Italy, in cases of retention arising from spasm combined with permanent stricture.

These are the only instances in which I have had an opportunity of trying the effect of the Nicotiana in retention of urine. I have ventured to detail the cases, as illustrative of three different causes of retention, each, however, corresponding in the impracticability of the introduction of instruments, and each having resisted the ordinary modes of relief.

The operation of Nicotiana varies much in different individuals, and is influenced in some degree by the habit of smoking or chewing tobacco. It generally acts very powerfully, and I have known it produce most alarming syncope; it ought not, therefore, to be adopted indiscriminately in slight cases, but reserved for instances where more simple means have failed. It is, probably, in consequence of the occasional violence of its action, that medical men have been deterred from using it, except in cases of strangulated hernia, as I am not aware of its having been before tried in retention of urine.

Its virtues as an antispasmodic are so eminent, that I was induced to try it once in a very bad case of tetanus, in which, although it afforded a temporary alleviation from spasm, the exhibition of the enema caused so much agitation that it was not persevered in. Should such a case occur again, or should I happen to meet with a case of hydrophobia, I should be much inclined to try the effect of an extract of Nicotiana made into a suppository and placed up the rectum. This form of admi-

nistering the medicine would embrace many important advantages. Its strength might be better regulated than by an infusion or the smoke. It would produce little or no irritation; it might be easily removed if found to operate too violently; and, lastly, if its effect were salutary, it might be retained for a much greater length of time than the injection. As the case to which I have just alluded was attended with some peculiarities, the particulars of it may not be unacceptable to the Society, though unconnected with the present subject.

Case of Tetanus.

Joseph Owen lacerated his great toe with a block of wood. There was nothing remarkable in the appearance of the wound, which was granulating; when, on Tuesday, Feb. 26, about three weeks from the receipt of the accident, he was seized with pain and stiffness in the muscles of his back, and was troubled with severe cramps in his legs and thighs. These symptoms rapidly increased in violence, and in a short time his jaw became affected; the muscles of the abdomen and neck afterwards partook in the affection. In a word, all the voluntary muscles were affected with tetanus. I found him in this state with a countenance expressive of the greatest terror and anxiety; his pulse was strong and full, beating about 140 in a minute, and his whole body was covered with a profuse sweat. I immediately bled him to the amount of twenty ounces, and gave him pulveris ipecacuanhæ comp. gr. xv. calomelanos gr. v. The spasms were much relieved by the loss of blood, were less frequent, and of shorter duration. A physician who now saw him, ordered him to take large quantities of wine and sago, and to continue taking the pulv. ipec. comp. gr. v. omni bihorâ. The wine aggravated the complaint so much, that its use was soon discontinued. I now tried the enema of tobacco smoke, the result of which has been related above. Towards night the spasms were again very violent, and ten ounces more of blood were taken away, after which he appeared much easier; his pulse became softer, and he broke out into a profuse sweat; the muscles of the abdomen

relaxed, and were evidently affected by respiration. The blood which had been drawn in the morning was most remarkably buffed and cupped. The following morning I found him much better, and he had slept for some hours in the night. He had not passed any fæces, and felt very desirous of easing himself, but was prevented by the spasmodic affection of the muscles whenever he exerted himself in the slightest degree. I directed him to have clysters with oleum ricini thrown up, which returned without any fæculent matter. He experienced much difficulty, and an aggravation of the spasms whenever he attempted to make water, which was small in quantity and very turbid. He was so much worse towards evening, that twenty ounces more blood were taken from his arm, which again procured him ease and some sleep. In the course of the night he passed a fluid stool; the following morning, his pulse being still full and hard, and the spasms being occasionally violent, though much less frequent, I took twelve ounces more from him. He experienced so much ease after each bleeding, that towards evening he requested to be again bled, being persuaded that it was the only means of obtaining a quiet night; accordingly twelve more ounces were taken. He passed a tranquil night, and slept three hours at one time; early in the morning he had three copious evacuations. He was now considerably better in every respect; his pulse was much softer, and he was able to take some nourishment; his countenance was less anxious, and he no longer talked of dying. During the day he was much agitated by his relations coming to visit him, and at night it was necessary to bleed him to the amount of sixteen ounces. On Saturday morning he was much better; he had slept a great deal during the night, and was much refreshed. He said that he felt much improved, but very weak. Some arrow-root and jelly with a little wine were given to him; but the wine reproduced the spasms, so as to render it necessary again to have recourse to the lancet at night. All Sunday he was so much better that I entertained confident hopes of his surviving; the principal pain he complained of was across his back and belly, and in one thigh. On Monday he continued to improve; but unfortunately his friends paid

him another visit, and at his request gave him some porter, which reproduced the spasms, but in a much diminished degree. Towards evening he complained of weakness, his countenance had changed much during the day, his pulse became very frequent, and when sleeping he rambled a little. During the night he sunk rapidly, and the following morning expired. The blood, to the very last, exhibited the strongest marks of inflammation.

Dissection.

Nothing particular was found in the head; the veins of the pia mater were rather turgid with blood. The thoracic and abdominal viscera were healthy. On the surface of each psoas magnus muscle there was an effusion of blood, on removing which the muscular fibres were seen much lacerated and altered in texture, being quite soft and giving way under the fingers. This lacerated appearance occupied nearly the whole thickness of the muscles to some extent. A similar effusion of blood had taken place in the sheath of the right rectus abdominis, and the muscular fibres were torn and quite soft, like the muscles of an animal that had been hunted to death.

Though this case terminated fatally, I conceive that the appearance of the blood and the remission of pain on bleeding, fully warranted my prosecuting this plan. The muscular fibres being actually torn asunder, sufficiently prove the violence of the attack; and I think, that although I was not so fortunate as to preserve his life, I rendered his severe sufferings more supportable. Blood-letting in tetanus has been much censured by different authors, but I must hesitate in subscribing to their opinions, which I conceive have been formed without sufficient trial, or rather, which have been adopted from one generation to another without the acquisition of any new facts. I am induced to form this conclusion from meeting with the following passage in Cullen. He says, "Blood has often been drawn in this disease, but it never exhibits any inflammatory crust, and all accounts seem to agree that the blood drawn seems of a looser texture than ordinary, and that it does not coagulate in the usual manner."

Now either the case which I have just now related was anomalous, or Cullen has adopted opinions without sufficient grounds. As I do not possess any other facts on this head, I cannot pretend to decide on the subject, but scruple not to declare, that should such a case again occur, with as much arterial action, and with such appearances of the blood, I should certainly adopt a similar line of practice, combined with the use of the Nicotiana.

On the Mode of Ventilating and Warming the Infirmary at Derby. In a letter to the Editor.

[From the Journal of Science and the Arts, No. III.]

Sir,

The Derbyshire General Infirmary being celebrated, both at home and abroad, for the peculiar conveniency and economy of its arrangements, and for many valuable improvements, by which the objects of such an institution are more successfully accomplished than in any other hitherto established, particularly as it relates to the uniform temperature diffused through the whole house, accompanied by a copious ventilation, a short account of this establishment, and of the means by which it has been accomplished, may not be uninteresting to your readers, especially as this subject has of late become of general interest.

This building is of a cubical form, and consists of three stories. The basement contains the offices, two public warm-baths, a steam engine, and the warming stove. The middle story, the household part; and the upper story is entirely appropriated to the patients. This is divided into two parts for males and females, each consisting of a certain number of wards of different sizes, containing beds, and a large room occupied in the day by the convalescent patients. A certain part of each story is completely insulated from the rest for the reception of fever patients. This part has a separate

entrance, with offices and every convenience, so as to preclude the necessity of any communication with the other parts of the house.

The apparatus employed for warming the building was invented by W. Strutt, esq. of Derby, in the year 1792, and has been extensively used by him for various purposes ever since that period. In adapting it to the above institution, the inventor connected with it a more perfect means of ventilating than had hitherto been adopted, securing at all times a constant change of air in every ward, independent of the casual openings of the doors and windows.

The stove is placed about twenty feet below the patient's story, and is calculated to warm a large quantity of air, while it is passing through it immediately from the atmosphere. The air derives its heat from an iron vessel about four feet square at the base, and six feet high, the top part being arched, forming a groin. This vessel is placed with the mouth downwards over a fire place, so that the interior surface may be constantly exposed to the flame and radiant heat. The smoke escapes through a narrow opening under the flange of this vessel into a flue on each side, which afterwards unite and pass into a chimney. All this part, as well as the ash-pit and fire-place, are carefully secured against any communication with the exterior parts of the vessel; which is intended to heat the air for warming and ventilating the rooms.

This vessel is formed of wrought iron, riveted together in the manner of steam-engine boilers, and is called *the cockle.* The room in which the exterior of this vessel is exposed, communicates with a subterraneous passage, about four feet square, and extending to about fifty yards from the building. From this point a perpendicular shaft arises to about twelve or fifteen feet above the surface of the ground. This opening is terminated by a cowl or turncap, provided with a vane, which has the effect of keeping the entrance for the air always presented to the wind. This entrance insures a current of air towards the stove equal to the velocity of the wind. I will now explain how the current of air is determined to the cockle, on its way to the different rooms to be warmed.

The cockle is surrounded by a brick wall of nine inches, leaving a cavity between the wall and the cockle about nine inches wide. In this wall are left square openings of about two inches, opposite to the iron surface. These holes are distant horizontally a brick in breadth, and perpendicularly a brick in thickness; each of these square holes contains a square tube made of rolled iron, extending the opening to within about half an inch of the side of the cockle. This wall with openings and tubes at similar distances extends to the very crown of the groin, the brick-work being groined of the same shape as the cockle. The number of holes and tubes in the whole surface is about 600.

The lower half of these tubes are for the admission of cold air, which strikes the cockle perpendicularly to the surface. The upper half of the tubes are surrounded by a chamber which contains the hot air, and of course is completely insulated from the rest of the room. When the cold air enters the lower portion, it first strikes the hot cockle, and then rises into the upper cavity, from which it cannot escape but through the upper set of tubes into the hot air chamber; but before it enters these tubes it must make various eddies, by which it will be often brought again in contact with the upper part of the cockle. By this means the air is made to carry off the greatest possible quantity of heat: this will also depend upon the velocity of the current, which is as the square root of the height through which the heated air has to ascend, before it is delivered into the rooms.

From the hot air chamber the air is conveyed by a vertical funnel up to the level of the patient's story; from this point it is conveyed by horizontal flues to the different rooms. The area of the section of the perpendicular funnel is about 7 feet, and the average velocity of the air is about five feet per second, at the temperature of 130°, allowing the average temperature of the air in winter to be 40°. This is when the fire of the stove is moderately kept up, and when it would consume from three to four cwt. of coals in twelve hours. This stove, if the fire was kept up night and day, would keep 200,000 cubic feet of space at 60° in the coldest part of the

season; the rooms not exceeding ten feet in height. The openings from the flues into the different rooms are provided with registers, to adjust the quantity of air required to produce the limited temperature, which is 60°. The outlet from each room is a common chimney. The whole of these terminate in the roof the building. The foul air which they bring escapes into the atmosphere through a turn-cap similar to that through which the air enters, with the exception of the aperture being always presented from the wind, by placing the vane on the same side as the aperture.

In the summer season the air passes through the same flues as in winter, but the foul air escapes at the top of the room instead of the bottom. The subterraneous passage being about the temperature of the earth, cools the air in summer, and gives to it a certain degree of heat in winter which economises fuel.

Mr. Sylvester of Derby, from whom I have obtained these facts, will very soon publish a particular account of this method of warming and ventilating, with working plates engraved by Mr. Lowry. The same work will embrace many other valuable improvements belonging to the same institution, with their application to similar public buildings, churches, private dwellings, and manufactories.

Some account of a contrivance, which was found of singular benefit in stopping Excoriation and Ulceration consequent upon continued pressure in bed. By W. Heberden, M.D. F.R.S. Fellow of the Royal College of Physicians, &c.

[From the Medical Transactions published by the College of Physicians in London, Vol. V. 1815.]

As the ultimate object of the medical art is the removal, or alleviation, of those evils to which the human body is exposed, I make no scruple of laying before the College of Phy-

sicians, some account of a contrivance, from which I have lately experienced great benefit; though strictly speaking, the calamity be no disease, and the remedy no medicine. There is no one in the habit of attending the sick, but must have had reason to deplore the wretched condition of those, who being bedridden through accident, or infirmity, have contracted sores of a very painful and dangerous kind by long pressure, especially if the patient lie in the wet and filth of his own body which he is unable to restrain.

In the month of November last, a lady above four-score years old, in a declining state of health, was seized with a hemiplegia; which, besides the extinction of voluntary motion on one side, was accompanied with an inability to articulate, and a total unconsciousness of the natural wants of the body. In this sad state she was attended with all the care, which an apprehension of the evils likely to ensue could suggest; the skin was preserved entire for the first fortnight; but at the end of that time, notwithstanding all the efforts to prevent it, the bedding and room began to grow offensive, and excoriation and ulceration were commencing in the parts most exposed to the superincumbent weight of the body, and the fermenting steams of the bed. The mischief seemed to be rapidly increasing under the unfavourable circumstances of a helpless old age, when the contrivance I am going to describe was adopted; by which the sick chamber was immediately rendered sweet and wholesome, the ulceration ceased, and in less than six weeks the sore places were perfectly healed, and covered again with a sound skin; though the disabilities of all kinds, which had originally occasioned the malady, continued without any abatement for more than three months, for so long was the life protracted. It may be questioned, how far the delaying of the final stroke deserved the name of a blessing under such sad circumstances. The freedom from the pain and misery of an extensive sore and mortification are at least blessings of no trifling value; and in this case must be attributed, under providence, to the use of the machine, of which an explanation is subjoined.

In the hope that other sufferers, from so distressing and by no means unfrequent a calamity, may derive equal advan-

tages from the adoption of a similar plan, I have thought I might render an acceptable service both to physicians and patients, by making this more generally known. It is no little recommendation, that it is very simple, is applicable to all beds, and is of so easy construction, that in the instance, from which I have drawn up this account, it was completed, and fit for use, within ten hours from the time it was ordered. In the following figure A B C D represents a frame, or rather the upper

B

surface of a frame, of which *a b c d* is the corresponding surface about six inches below: *h* and *i* are cross-bars for the purpose of strength: *e f* is a drawer, made to pull out on either side, containing a pan, which, when the drawer is in its place, lies immediately under the opening *g*, and is intended to receive every thing that may pass from the body: *k* is a sort of desk for the convenience of raising the patient's head. At A and B is made a notch to receive the front bed-posts: at C and D are projections to go on each side the back of the bed in order to keep the frame more steady. Upon this frame is fitted a mattress with a hole in the centre corresponding to the hole *g*, and divided at *i*, so that one part of it may be raised by the desk of the frame without moving the remaining part from its situation. The under blankets and sheets have likewise a hole cut in the middle. To the mattress it was afterwards found convenient to add a loosely stuffed circular cushion immediately to surround the hole; which, not being fixed, could without difficulty be changed, and washed

as often as it was found requisite; and still more effectually to prevent the bed from being soiled by the casualties incident to a protracted illness, a piece of oiled silk was sewed round the opening in the mattress. In order to use it, it is obvious that nothing more is necessary than to remove the ordinary bedding, and to let this frame with its mattress rest upon the bedstead. The machine would perhaps be rendered more complete by the addition of a foot-board, whenever it should be applied to a bed, which had not one already attached to it. This will have considerable effect in preventing the body from slipping too forward on the hole, when the mattress, from the continued pressure, begins to sink in that part.

Some Observations on the Pathology of Insanity. By George Man Burrows, M. D. F. L. S. &c. London.

[From the London Medical Repository, for October, 1816.]

Insanity in every form is a disease the most afflicting in its consequences on social happiness of any to which mankind is subject. To detail what these consequences are, is quite unnecessary:—they are felt by all ranks, and in all civilized countries, and in none more extensively than in this kingdom. This disorder, which at once deprives man of his highest attribute—reason, and degrades him among created beings, may be traced to very remote periods; for we find all its well known effects interwoven even with the fabulous history of the Heathen Mythology. It is distinctly treated of by the most ancient Greek and Roman, as well as Arabian authors, who professedly wrote on medicine, and by many philosophers who have noticed it among other phenomena in man.

The moderns have supposed that they are less happy than the ancients in the treatment of this disease. For this retrogression in therapeutics, I know no particular reason assigned; except it be, that the hellebore, the favourite remedy of the ancients, now employed, has not the same qualities as that which grew in Anticyra.

As experience evinces that the improvement in the treatment of insanity is not commensurate with that perfection in the therapeutic art of which the moderns boast, it may be useful to investigate the causes of this defect. The limits to which it is requisite to confine myself will not here admit a full discussion of the subject. But there are many facts sufficiently obvious, and well worthy of notice, which may throw light upon it; some of which, with great deference, I submit for consideration.

The fathers of physic had but a very confused knowledge of physiology: hence their pathology of diseases was often erroneous; their practice being of course guided by the opinions on these subjects which then prevailed. Their system of pathology is contradistinguished from others that have since flourished, as—the humoral pathology. According to this, all diseases originated in the condition of the humours of the body: a redundancy of yellow bile was the supposed cause of mania; and black bile, of melancholia. But as all disorders affecting the mental faculties had, in superstitious times, a peculiar degree of interest, we find that researches into their causes were not omitted. Human anatomy was then rare: and comparative anatomy was resorted to on most occasions of experimental inquiry. Hippocrates says,* he visited Democritus, to judge of his sanity, at the request of the citizens of Abdera, who thought him mad. He found the philosopher dissecting animals, in order that he might examine the liver, and endeavour if, in the nature of the bile, he could discover the cause of insanity.

The labours of the numerous learned and industrious anatomists and physiologists who have flourished within the last century and a half, have greatly extended our knowledge of the animal economy: they have likewise corrected many former errors, and much enlarged the limits of pathology.

The ancients had not these advantages; and therefore probably were more exact observers of the diagnostics of diseases, and more strictly attended to those clinical duties which so eminently contribute to form good practical physicians.

* *Epist. Hippocrates Damogeto,* sect. 8.

They had remarked what, I believe, if not always, is more frequently true, that in all cases of insanity, the biliary secretions are in fault, and sensibly changed. Hence they considered vitiated bile as the cause of this disease. They were not aware that such changes resulted from a morbid action in the liver—the organ by which it is secreted; and that, if this viscus be restored to its healthy state, the bile would be natural in its appearance, and be regular in its quantity.

Whatever credit may be given to the opinions of the ancients relative to the cause of mental derangement, none who read their writings will dispute the accuracy of their description of its symptoms. Hippocrates, Celius Aurelianus, Celsus, and Galen, are very comprehensive; but Aretæus will probably never be surpassed for minuteness and truth of delineation.

For almost eighteen centuries, the theory of this disease, and the practice in the treating of it, remained nearly stationary. Indeed, I do not remark any writer, till within a century, who has advised any thing strikingly novel, or who has suggested any thing more than the ancients. Nay, perhaps I may advance another step, and state my suspicion, that the farther we have deviated from the rules of practice they laid down for the treatment of insanity, the more unsuccessful has been the practice, and the fewer the cures that have resulted.

Contemplating the progress of medical knowledge, it does certainly appear not a little singular, that, in a disease involving all the dearest interests of society, so little exertion has been made to elucidate the cause, or improve the medical treatment of it. This is a real reproach on modern medicine.

Many English writers in particular, exploding the old humoral doctrine of pituita, or yellow or black bile, as exciting causes, have considered insanity as an idiopathic disease of that organ whence is derived sensation and volition: and as the brain is inferred to be the seat of the sensorium, it is consequently the focus and radius of insanity. In support of this hypothesis, many physiological experiments have been instituted, and much ingenious speculation has been hazarded; but, unfortunately, the deductions have been so intertexed with metaphysical dogmas, that ordinary minds, guided by

the induction of facts alone, have been embarrassed and bewildered; and have shunned the investigation, and even the treatment of the disease, as involving mysteries they cannot comprehend: while the nosologist, in his fondness for system, has amused himself with fanciful arrangements, assuming that the aberrations of a disordered reason were the real phenomena of specific diseases.

Even inquirers, who wisely sought for the causes of diseases from morbid examinations, have entered upon and conducted their researches with minds fettered by certain preconceived and favourite hypotheses; and have confined their examinations to those parts only, where they have *pre-supposed* insanity to have originated.

But why should the physiologist decide that the brain alone is the seat of the sensorium, and that thence sensation and volition is derived; or that it is the seat of the sentient principle, or of our perceptions or ideas; and that its integrity is essential to these operations? Have not morbid examinations disclosed, that all the functions, generally ascribed to the brain, have been actually performed when the texture of the brain appeared to have been almost destroyed?—or where great lesions or derangements of that viscus have been discovered in persons after death, in whom nothing to excite a suspicion of organic disease had been detected while living? And why should the pathologist presume that the derangement of the intellectual powers, or alienation of mind, emanate from certain morbid appearances he observes in the cranium, when similar appearances have been remarked in the crania of persons who died of other and very opposite diseases?—or why should he conclude that insanity is consequent upon lesions or derangements of the contents of the cranium, when, in many persons who have died mad, no sort of lesion or derangement, or vice of formation, could be discovered in their skulls? Yet such are the facts; and they are too numerous to require citing. If, then, a person can live, possessing and exercising all his faculties, in whose brain a lesion, or a great state of disease be found, it is decisive that a whole and sound brain is not indispensable for regulating all the functions of the animal economy; and that insanity is not an absolute consequence. If

one fact only of this kind be but proved, all the fine-spun hypotheses of the metaphysicians vanish; and we must look elsewhere besides the brain for the causes of insanity.

I by no means intend to infer that the seat of insanity is never in the brain. On the contrary, I hold it very possible that such a morbid state of those parts may, exclusively of injuries, be induced, by the continuance or succession of morbid actions, as to occasion derangement of the mind. But then this is an effect; while the cause, perhaps, is seated in some diseased and quite distant organ: and this effect may remain when the cause itself has ceased. Recovery from insanity sometimes happens without any medical means being applied. But when a person is insane, the moral, and the dietetic regimen being properly attended to, the primary cause of his insanity, especially if in the chylopoetic viscera, may thereby be removed; and the brain, which has been sympathetically affected, gradually resumes a healthy action. Organs, slightly deranged in their functions by disease, are soon restored to health: but if the attack be often repeated, a morbid action is excited, and goes on; and, at length, in spite of every attention, is often irremediably fixed. Thus it is well known, that in all incipient cases of insanity, the prognosis is favourable, except where it is the consequence of an organic injury; and that it becomes more unfavourable nearly in a ratio with the frequency of the attack.

It is acknowledged that the brain is the origin of the nerves; and the nerves may convey the impulse given them, as the chords of a musical instrument conduct sounds; but this does not imply that sensation is communicated only when it is applied to the origin of the nerves—the brain. Sensation may be communicated to the nerves from their extremities, as well as from their sources; and be directly carried from one part to another by some branch of those plexi of nerves which intersect and connect all points, and produce, by consent, a certain feeling over the whole of the body, or to any particular part of it, which we denominate sympathy. Perhaps we know not how to define sympathy; yet it is by sympathy of parts only that we can account for those anomalous symptoms which occur and perplex in the treatment of diseases.

Many modern writers have most forcibly and judiciously commented upon the connection by sympathy between the brain and the chylopoetic viscera, and have observed, that whether the primary disorder be seated in the one or the other, there is a reciprocal sympathetic action; and, that at length the functions of all the consenting parts may become deranged. But although the moderns have more generally insisted on the influence of sympathy, and amplified upon it; yet the ancients appear also to have been apprized that much is often to be imputed to this as an occult source of many otherwise inexplicable symptoms.* Hence many useful practical hints have been gathered; but it is to be hoped that the origin and nature of morbid sympathies will, from their great importance, be much more closely investigated.

Considering the morbid appearances which are detailed by British and foreign authors, who have directed their researches with a view to the enlightening of the pathology of insanity, and which must be accepted as proofs, at least, of industry; it is very extraordinary that all should pursue the same course of inquiry, regardless of the inutility, in a practical point of view, of the labours of their predecessors and contemporaries.

One pathologist only shall be quoted, although the remark applies generally, as an instance of how much talent and time maybe fruitlessly wasted when the mind enters upon inquiry, prejudiced: *John Ernest Greding*, physician to the workhouse at Waldheim in Saxony, dissected the bodies of some hundreds of maniacs: he gives a very accurate account of all the morbid appearances he met with in the cranium, and in the thorax of each body; but he actually neglected the examination of the viscera of the abdomen!† Here were presented opportunities of acquiring the most satisfactory information, if they have corporal existence, as to the causes of insanity. How much have humanity and science to lament this omission!

* Nonnullos verò et corripit à nervis procul à capite positis incipiens, quicunque principium *in consensum* affectus inducunt.—*Aretæi de Causis et Signis*, lib. i. cap. 5.

† *Appendix to Dr. Crichton's Inquiry.*

I have diligently consulted every accessible authority to supply the defects of Greding. Some detail dissections of maniacs; but the impression that the cause of the disorder is in the brain, has so much pervaded and influenced the examinations, that they have been almost entirely confined to the head and the thorax. This oversight applies equally to Bonetus, Morgagni, &c., as well as to more recent pathologists. May we not, therefore, fairly ask, if the deficiency of our knowledge of the causes of insanity proceed not from too much refinement?—or if physiologists have not been too speculative and metaphysical?—or pathologists too prejudiced?—or nosologists too fanciful?—and if moralists also have not been too hypothetical? If these doubts be affirmatively answered, shall we not have reason to conclude that our success in the treatment of insanity has not equalled that in other diseases, because our inquiries have not been conducted on sound philosophical principles?

I have recently inspected the bodies of five insane persons: two of them died in a state of mania; one of these died in convulsions; and three were afflicted with melancholia. The head of him who died of convulsions presented every appearance of too great determination of blood; a small portion of which, as well as some water, was effused between the dura and pia mater; there was also a little brownish-coloured water in the ventricles. In the other case of mania, there was no mark of disease, except that the vessels of the dura mater were a little turgid. Both these patients had been at first melancholic. In one of the cases of melancholia, there was no vestige of disease in the head. In the other two, there was water in the lateral ventricles. In all the five *the liver was diseased;* and mostly on the concave side; but there was only one in whom it was at all enlarged.

But although they who have examined and described the morbid dissections of the insane, have so generally either quite overlooked, or have been entirely silent on the condition of the liver, yet Dr. Cheyne of Dublin, in his admirable Observations on Apoplexy (p. 178,) mentions a circumstance that almost tends to establish a constant state of hepatic disease accompanying mental derangement: he says, that Mr. Todd,

Surgeon to the House of Industry in Dublin, found the liver more or less diseased in upwards of four hundred maniacs and idiots, whose bodies he had examined! Dr. Cheyne judiciously remarks, that this fact may throw a ray of light on the mystery in which the cause of insanity is involved. With this opinion I cannot but perfectly accord; and conceive it must have the same weight with others as I confess it has had, conjointly with some experience, on my mind. But even this, conclusive as it is, has, I understand, led to no result proportionate to its relativeness and importance.

Many have attributed the causes of insanity to some defect or alteration in the sanguiferous system; but it does not appear that they who support the doctrine, have attained any greater degree of success in the cure of it.

That insanity, therefore, originates more generally in a corporeal cause, than is allowed, is, I think, clear.

If the cure be more precarious and rare since the present rationale has been adopted, it is surely imperative to inquire most seriously into the causes of the failure, and to substitute any other that has the guide of reason, and the experience of the past.

Without any predilection for the humoral pathology of the ancients, yet, surely it may be admitted, that when they supposed bile, either in a redundant or deficient quantity, and atrabilis, or bile in a vitiated state, were exciting causes of insanity, they were not so much in error as the moderns might, from their own views, be led to imagine. Consonant with their reasoning, their plan of cure was judicious; and, assuming it as fact that the liver is greatly in fault in the majority of cases of insanity, the system of evacuation, friction, bathing, gestation, occupation, and temperance, duly enforced, was the most likely that could be suggested to obtain a cure. By steadily pursuing this practice, it is not improbable that the ancients were really more successful in the treatment of this disease than the moderns.

We daily witness many symptoms that give no indication of their origin; and for which it is with great difficulty, or we cannot at all account; but which are eventually traced to some derangement of the chylopoetic viscera; and most frequently

to that of the liver. Dyspeptic symptoms ensue; and if the cause be not detected, or be neglected, it is not uncommon for a train of other symptoms to follow, which form the true hypochondriasis—a disorder which is very properly classed by Sauvages and others, though not by Cullen, among the *vesaniæ.* This, at length, often terminates in decided melancholia: upon which, mania, also, frequently supervenes. But the latter often occurs without any precursory symptom of its approach. In the two former diseases, almost always—and, in the latter, generally—the appearance of the fæcal evacuations strongly denote the morbid action of the hepatic and alimentary functions.

As soon as the state of the patient will admit, but which cannot be accomplished while very violent, I have accurately examined the epigastric and hypochondriac regions; and I have generally had clear demonstrations, either by the expression of uneasiness on pressure, or from tension and fulness, that the liver was not in a sound state. Pain about the præcordia, commonly, and symptoms of dyspepsia, or of a morbid appetite, have universally preceded the attack. Some have complained of actual pain in the head; others, of a weight; others, of vertigo, or confusion. The tongue, in all the cases both of mania and melancholia, was always foul, and generally coated with a viscid phlegm.

Conformably with my own deductions, my practice in cases of insanity has been regulated; and I will add, that the result has been most satisfactory. But as my present design is rather to point out what I humbly conceive to be the great error in investigating the pathology of insanity, than to discuss either the diagnosis, or the curative means to be employed, I shall only venture to state, generally, that eleven out of sixteen cases of melancholia, since March, have completely recovered: nine of which were disordered for the first time; two had been repeatedly ill. Six of these commenced with mania, but soon sank into a low state. Some cases, which have since occurred, I do not notice, because the time is not sufficient to form any judgment on the event.

The alvine excretions in every case were very different to those of healthy persons. In twelve of them the stools were

dark, and exceedingly offensive. In four they were of a clay-colour, indicative of obstruction of the biliary secretion.

In cases of pure mania I have not been so happy; and, although some have recovered, I must candidly confess that I have attributed the fortunate issue more to Nature than to the means I have employed. The diagnostic marks of disease of the abdominal viscera, have not been so prominent in any of the maniacal as in the melancholic patients; although the alvine discharges bore almost always a very morbid appearance, and the peculiar odour.

It has been asserted by many who have had the care of the insane, that they are commonly insensible to temperature; and that the *primæ viæ* are difficult to excite. As a general law, I must contradict this position. Apathy to surrounding objects is frequent: but I have never yet seen an insane person that did not appear in some way or other sensible of great hanges of temperature. Constipation is certainly common. But I am confident it would prove highly injurious, if a practitioner were always to prescribe with the impression of torpidity of intestinal action: it is therefore better to act with caution. Still I am of opinion that all medicines in mania may be usually administered in larger doses than in any other disorder; and I am persuaded that the medicaments prescribed more often fail from the smallness of the doses given, than from the paucity or the inefficacy of the pharmaceutical remedies which we possess.

In medicinal remedies we have a great advantage over the ancients: the virtues of foxglove and mercury, and many active chemical preparations were unknown to them; which now justly rank as powerful auxiliaries in the cure of insanity.

That the moral means which the good sense and humanity of the moderns have so happily devised and applied, must be highly useful in many, nay, in most cases, is indisputable; but they ought not to be wholly relied on: they are adjuncts only to the medical means indicated. It is a great fault, and very much to be lamented, that the moral remedies are not of readier access, and rendered applicable to every situation where insane persons are placed.

I am aware that these succinct and cursory observations

will little elucidate this intricate subject; but they may be serviceable by attracting greater attention to the pathology of insanity—the only sure guide to a more successful *methodus medendi.* In this sketch, however, I have endeavoured to show the probability, that insanity often, if not usually, arises from sympathy with parts morbidly excited, and distant from the brain; and that this action is reciprocally exerted; and therefore that the causes of the derangement of the intellectual functions should not be sought for within the cranium only.* Besides, the success attending the treatment of insanity by the ancients is a direct illustration of the truth of this theory.

Possibly I may entertain other opinions regarding insanity, which will by many be deemed heterodox and untenable. In all cases of doubt it were better to consult the judgment of others. I shall not, therefore, hesitate submitting mine to the ordeal of the profession: I conceive:

1. That insanity, in which mania, melancholia, hypochondriasis, and all the species and varieties of nosologists are included, is never an idiopathic, but always a symptomatic disease.

2. That the diseased appearances found in the skulls of maniacs is an *effect,* not a *cause;* but that the effect may remain when the cause has ceased.

3. But that morbid alterations of the contents of the cranium do not always take place in maniacs; and when such are visible on dissection, they are the consequences of inflammation, congestion, or injuries from blows and wounds; or from sympathy with some derangement of the thoracic or abdominal viscera.

4. That whether such morbid alterations arise from diseased viscera, inflammation, congestion, compression, or malconformation, or any other exciting cause, synchronous effects may be produced on the sensorium, and consequent derangement of intellect ensue.

5. That incipient insanity will be most readily and more frequently cured, by applying the remedies to restore the healthy functions of the chylopoetic viscera, except there is another distinct and obvious cause: but where there is evident

* *Verum præcipua furoris et melancholiæ sedes viscera sunt.—Aretæi de Causis et Signis Morb. Diuturn,* lib. 1. cap. vi.

injury, great excitement, or congestion of the brain, applications and remedies, with a view to relieve, and as preliminary or as adjuncts to other means, may be of great use.

6. That a proper application of moral means may be highly conducive, combined with the physical, to the restoration of a sane state of mind.

7. That hereditary insanity, as it is called, is the consequence of some peculiarity of the animal frame, which may be propagated like any other vice of form in man or other animals.

8. That this disposition may remain latent, and never be displayed, provided no direct exciting cause be applied.

9. That this disposition may be modified or extenuated by crosses with families, in whom it does not exist; and may lay dormant for several generations; precisely as we see in breeds of domestic animals, which can be traced back, without blemish, for many years; and yet at last an individual shall be produced, having all the marks and characteristics of the cross or of the aboriginal stock.

It is probable the foregoing propositions will provoke discussion: nor shall I shrink from it. The subject of insanity is an open and expansive field; and the tillage is but just commenced: the soil is neglected, not exhausted, and will yield a rich harvest to the cultivators.

Possessing so few of the requisites, I would not presume to attempt any elaborate treatise on so obscure a disease as insanity. Yet I have the vanity—a vanity which I trust will be pardoned, when the importance of the subject is weighed—to imagine, that from the gleanings of what has been noticed by others, from what I have personally remarked myself, and from reasoning, some observations may be embodied, which may throw light on this—the most fearful and dreaded of all visitations.

However ardent the inclination, I am too sensible that there are insuperable obstacles to prosecuting inquiries into the pathology of insanity. To effect this would require to examine the bodies of many who have died insane. But if few opportunities of this nature in private practice occur, they are fully enjoyed by those who are so fortunate as to be attached to

public insane establishments: and let us hope they will not be wholly neglected. For myself, I have only to observe, that I shall consider it a great obligation, whenever such an opportunity is afforded me: and through this public channel I earnestly solicit this favour.

For the five dissections I have alluded to, I am indebted to the friendship of different medical practitioners. And I should be wanting, were I to omit this or any other occasion of expressing my gratitude for these, and the many other instances of friendly attention I have received.*

62, *Gower Street, Bedford Square.*

* Since this paper was in the press, it has been suggested to me by a most distinguished member of the profession, for whose opinion I entertain the highest respect, that, as I had proposed to occasionally offer some *Observations on Insanity*, it would be attended with considerable advantage were they to be published in the REPOSITORY, in a series of *Essays*. This advice I mean to adopt. Had it, fortunately, been sooner given, I might have made a different and preferable arrangement. The value and interest of the matter must greatly depend upon the assistance I receive from the profession; and on this source I very fully rely. However, for any defect of mere arrangement in the present instance, I am confident I may claim indulgence.—B.

SELECTED REVIEWS.

An Analysis of the Mineral Waters of Dunblane and Pitcaithly; with general Observations on the Analysis of Mineral, and the Composition of Bath Water and some others. By John Murray, M. D. F. R. S. Edinburgh.

[From the Edinburgh Medical and Surgical Journal, for July 1816.]

The essay of Dr. Murray deserves to be very generally studied by professional men; but very few of them can have an opportunity of reading it in the philosophical work in which it is published. We therefore feel a pleasure in being able to give it greater publicity; and only regret that its great length obliges us to omit some parts, and abridge others.

Dr. Murray was led to these considerations in consequence of analysing the mineral waters of Dunblane and Pitcaithly, both in Perthshire. The very ingenious method of performing these analyses, and the curious chemical views stated in regard to the methods of analysing mineral waters in general, are highly interesting to the chemical student; but we must content ourselves with extracting the results obtained from a pint.

	Dunblane.	*Pitcaithly.*	
	North Spring.	South Spring.	
Atmospheric air	-	-	0.5
Carbonic acid gas,	-	-	1. cubic inch.
Muriate of soda,	24	22.5	13.4 grains.
——— lime,	18	16.	19.5
Sulphate of lime,	3.5	2.3	0.9
Carbonate of lime,	0.5	0.3	0.5
Oxide of iron,	0.17	0.15	trace.
	46.17	41.25	34.3

"It is a question not unequivocally determined, and perhaps not capable of being determined, in what state the saline ingredients of a mineral water exist,—whether the acids and bases are in those binary combinations which constitute the different neutral salts, or whether they exist in simultaneous combination, the whole acids being neutralized by the whole bases. If the former, which is the more common, and perhaps the more probable opinion, be adopted, it is at least certain, that the state of combination may be modified by the analytic operations, and that the binary combinations obtained by these may not be precisely those which existed in the water. In the case of the Dunblane water, for example, the ingredients obtained are muriate of soda, muriate of lime, and sulphate of lime. Now, it is possible that the sulphate of lime may be a product of the operation, not an original ingredient. The sulphuric acid may exist rather in the state of sulphate of soda, and when, in the progress of the evaporation, the liquor becomes concentrated, this salt may act on a portion of the muriate of lime, and, by mutual decomposition, form corresponding portions of muriate of soda, and sulphate of lime.

"A question of this kind is not merely one of speculation, but the solution of it may sometimes throw light on the properties of mineral waters, particularly on their powers of affecting the living system. The present affords a very good example of this. Sulphate of lime is a substance apparently inert. If it exist, therefore, as such in water, it can contribute nothing to its efficacy. But in the other state of combination which is supposed, both the quantity of the muriate of lime, the more active ingredient, will be greater, and the presence of sulphate of soda will in part account for the purgative operation which the water exerts.

"There is no very direct, and perhaps no decisive experiment, by which this question may be determined; for any method which would cause the *separation* of either substance as a binary compound, may also be conceived to operate by causing its *formation*."

Dr. Murray then gives some arguments in favour of his opinion.

"These results do not absolutely establish the conclusion,

that the sulphuric acid exists in this water in the state of sulphate of soda; yet, on the whole, this is the more probable opinion. If it be admitted, the preceding statement of the ingredients, and their proportions, must be altered. The sulphate of lime is of course to be omitted. The sulphate of soda, which is to be substituted for it, cannot be obtained by any method; but the quantity of it may be inferred, from the quantity of sulphate of lime which is formed by its action on the muriate of lime. Real sulphate of lime, and real sulphate of soda, are very nearly equivalent to each other with regard to the proportions of their acid and base; so that the quantity of the one may nearly be substituted for that of the other; 3.5 of sulphate lime being equal to 3.7 of sulphate of soda. But this sulphate of lime is formed at the expense of a portion of muriate of lime, and its formation is accompanied with the production of a little muriate of soda; hence the proportion of the former must be a little larger, and that of the latter a little smaller, than have been before stated. 3.5 grains of sulphate of lime are equivalent to 2.8 of muriate of lime, which quantity, therefore, is to be added to the proportion above assigned. The equivalent portion of muriate of soda to be subtracted is 3. The whole proportions, therefore, will be the following:

Muriate of soda,	- -	21 grains.
Muriate of lime,	- -	20.8
Sulphate of soda,	- -	3.7
Carbonate of lime,	- -	0.5
Oxide of iron,	- - -	0.17
		46.17

"The quantity of sulphate of lime obtained in the analysis of the Pitcaithly water, being so much smaller than that in the Dunblane, it may perhaps be considered as an original ingredient; or, if even the opposite view be adopted, the change in the proportions, as indicated by the analysis, is much less. They may be stated as follow:

Muriate of soda,	- -	12.7 grains.
Muriate of lime,	- -	20.2
Sulphate of soda,	- -	.0.9
Carbonate of lime,	- -	0.5

"Sulphate of lime has been often stated as an ingredient existing in mineral waters, with muriate of soda and muriate of lime. It is almost superfluous to remark, that it is probable the original ingredients, in all such cases, are sulphate of soda and muriate of lime, and that the sulphate of lime is a product of the operation; or rather, that the portion of it equivalent to the quantity of muriate of soda, has this origin.

"It is a curious fact, which strongly confirms this, that in almost all the analyses of mineral waters since the time of Bergman, when they can be presumed to have been executed with any precision, where sulphate of lime is an ingredient, muriate of soda is also present. It is obvious, that, if the sulphate of lime has this origin, muriate of soda must also be formed. On the other hand, in the greater number of those analyses in which muriate of soda is an ingredient, we find also sulphate of lime; and, with the exception of the water of Harrowgate, sulphate of lime is always present, where muriate of soda and muriate of lime are conjoined.

"But the principal interest belonging to this view, is derived from its relation to a question which has often been brought under discussion,—Whether chemical analysis is capable of discovering the sources of the medicinal virtues of mineral waters? This question some have been disposed to decide in the negative, from finding examples of waters possessed of active powers, in which analysis does not detect any ingredients of adequate activity.

"On the general question, the remark by Dr. Saunders is perfectly just, that 'considering the comparative accuracy to which chemists are at present able to carry their inquiries, we can hardly suppose, that whatever slight error might occur in the estimation of minute quantities, the actual existence of any powerful agent on the human body, in any mineral water, should escape the nicety of research.' Yet though this is just, and though we can have no hesitation in rejecting the opinion which would ascribe the medicinal qualities of mineral waters to unknown or mysterious causes, or which would deny all power to those in which an active chemical composition cannot be discovered, difficulties on this subject undoubtedly exist, and there is some room for that scepticism which has been extended to this department of the Materia Medica.

"Of this no better example can be given, than the celebrated Bath water. It has always been found difficult to account for its powers; the ingredients which are obtained in its analysis being substances of little activity, and the principal ones, indeed, being apparently inert. It contains in an English pint, along with a slight impregnation of carbonic acid, about 9 grains of sulphate of lime, 3 grains of muriate of soda, 3 grains of sulphate of soda, $\frac{8}{10}$ths of a grain of carbonate of lime, $\frac{1}{2}$th grain of silica, and $\frac{1}{70}$th grain of oxide of iron. Now, from these ingredients unquestionably no medicinal power of any importance could be expected. They are either substances altogether inert, or are in quantities so minute, as, in the dose in which the water is taken, to be incapable of producing any sensible effect. Some have from this circumstance been disposed to deny altogether any virtues to these waters; but the reverse of this appears to be established by sufficient evidence, and what is still less equivocal, the injurious effects they sometimes produce, and the precautions hence necessary in their use, sufficiently demonstrate their active powers. To account for these, therefore, various hypotheses have been proposed. The observation has been urged, which, to a certain extent, is undoubtedly just, that substances given in small doses in a state of great dilution, may, from this dilution, produce more effect on the general system than the quantity given would lead us to expect. The temperature of the water, too, it has been supposed, may have a considerable share in aiding the effect; and these two circumstances in particular, it has been imagined, may favour the action of the iron. This is the view of the subject given by Dr. Saunders, in his Treatise on Mineral Waters. Some of the other ingredients, too, it has been supposed, may exert unknown powers. Thus, some effect has been ascribed to the agency of the nitrogen gas which rises through the water. And Dr. Saunders himself, apparently not very well satisfied with the reasoning he had employed, allows some weight to the opinion suggested by Dr. Gibbes, that the silicious earth assists in the general effect of the Bath waters;—remarking, that though there is only half a grain of it in a pint of the water, this forms no objection, when the great powers of very minute quantities of active substances are considered; that neither is

its insolubility in the animal fluids an objection, as it exists in the water in a state of solution; and that, though it has neither taste nor smell, it may be an active substance, since there are indisputably powerful medicines, which have little of either of these qualities.

"All this, it is superfluous to observe, is extremely unsatisfactory. With regard to the iron, the only active substance,—allowing full weight to the observations, that small quantities of active medicines, under great dilution, operate with increased power, and that a high temperature may aid their operation on the stomach,—still we cannot believe that one-sixtieth of a grain, the quantity in a pint of this water, can produce any important medicinal effect. And, with regard to the other substances, the reasoning whence their possible operation has been inferred, instead of removing the difficulty, rather places it in a clearer light.

"The view of the constitution of mineral waters stated above, enables us to assign to the Bath water a much more active chemical composition. There is every probability that muriate of lime is its powerful ingredient. The principal products of its analysis are sulphate of lime, muriate of soda, and sulphate of soda. The proportion of sulphate of lime is such, that part of it must pre-exist in the water, but part of it, there is reason to conclude, is a product of the analysis; the muriate of soda is entirely so, and the quantity of sulphate of soda is larger than what the analysis indicates. In other words, there exist in it muriate of lime, sulphate of soda, and sulphate of lime; and, during the evaporation, the muriate of lime being acted on by a portion of the sulphate of soda, muriate of soda and a corresponding portion of sulphate of lime are formed.

"On this view of the composition of the Bath water, it is easy to assign the proportions of the ingredients, from the products which are obtained in its analysis. In the formation of 3.3 grains of muriate of soda, which is the quantity obtained from a pint of the water, 3.1 grains of muriate of lime must be decomposed: 4 grains of sulphate of soda would be required to produce this decomposition; and, at the same time, 3.8 grains of sulphate of lime would be formed.

"The latest, and no doubt the most accurate analysis of the

Bath water, that by Mr. Phillips, gives the following view of its composition:

In an English pint,	Carbonic acid, - - -	1.2 inches.
	Sulphate of lime, - -	9 grains.
	Muriate of soda, - -	3.3
	Sulphate of soda, - -	1.5
	Carbonate of lime, - -	0.8
	Silica, - - - - - - -	0.2
	Oxide of iron, - - -	$\frac{1}{18}$ grain.

But, considering the composition according to the preceding view, the ingredients and their proportions will be,

Carbonic acid, - - -	1.2 inches.
Sulphate of lime, - -	5.2 grains.
Muriate of lime, - -	3.1
Sulphate of soda, - -	5.5
Carbonate of lime, - -	0.8
Silica, - - - - - -	0.2
Oxide of iron, - - -	$\frac{1}{18}$ grain.

"The peculiarity in the composition of the Bath water, compared with the greater number of saline mineral waters, is, that it contains a larger quantity of sulphate of soda than is necessary to convert its muriate of lime into sulphate of lime. Hence no muriate of lime is obtained after evaporation in its analysis; hence even a portion of sulphate of soda is indicated; and hence the large proportion of sulphate of lime which that analysis yields. In the Dunblane and Pitcaithly waters, the sulphate of soda is deficient; the muriate of lime is in large quantity, and is accompanied with muriate of soda; hence the entire want of sulphate of soda, the small quantity of sulphate of lime, and the large proportion of muriate of lime in their analyses.

"Muriate of lime, it is well known, is a substance of considerable power in its operation on the living system; in quantities which are even not large, it proves fatal to animals. When taken to the extent of six grains, the quantity of it

which, according to the preceding view, exists in a quart of the Bath water, it cannot be inactive. It is very probable, too, that a given quantity of it will prove much more active in a state of great dilution in water, than in a less diluted form; as, in this diluted state, it acts, when received into the stomach, over a more extended surface; and, besides this, whatever effect may be due to the high temperature of the Bath water, in aiding the operation of the minute portion of iron it contains, the same effect must be equally obtained in aiding the operation of the much larger quantity of muriate of lime. The conclusion, indeed, as to the importance of this effect, is much more probable with regard to the muriate of lime, than to the iron; for, supposing the quantity of the former to exist in the Bath water, which has been assigned, the dose of it taken in a quart of the water is not far from its proper medium dose, and is at least equal to one-half the largest dose which can be given, and continued without producing irritation; while the dose of the iron is not the one-hundredth of that which is usually prescribed. Under the circumstances, therefore, in which the muriate of lime is presented in the Bath water, it is reasonable to infer that it must be productive of considerable immediate effect.

"The speculation is farther not improbable, that, to produce its more permanent effects on the system as a tonic, it is necessary it should enter into the circulation. In a dilute state of solution it may pass more easily through the absorbents; while, in a more concentrated state, it may be excluded, and its action confined to the bowels. Hence the reason, perhaps, that in some of the diseases in which it is employed, scrofula particularly, it has frequently failed, its exhibition having been in doses too large, and in too concentrated a form. And hence it is conceivable, that in a more dilute state, as that in which it may exist in the Bath water, besides its immediate operation, it may produce effects as a permanent tonic, more important than we should otherwise expect.

"I may add, that the iron in the Bath water is probably not in the state of oxide or carbonate, as has been supposed, but in that of muriate. The muriate is the most active preparation of iron, and so far, increased activity may be given to

the slight chalybeate impregnation; and some modification of power may even be derived from the combined operation of muriate of lime and muriate of iron.

"It deserves to be remarked, that, in the most essential ingredients, the muriate of lime and the iron, the Dunblane and Pitcaithly waters are similar to the Bath water, only with regard to the former ingredient much stronger; the other differences are unimportant; the larger quantity of sulphate of lime, and the small quantity of silica in the latter, cannot be supposed to contribute any thing to its medicinal operation; the difference in the proportion of sulphate of soda is trivial, and the larger proportion of muriate of soda in the other waters, may rather be an advantage, rendering them more agreeable to the taste and to the stomach. The principal difference will therefore be that of strength with regard to the most active ingredient, the muriate of lime. The quantity of this is so large, that the tonic quality of the Dunblane or the Pitcaithly waters can scarcely be observed, and perhaps even scarcely obtained; their action being more peculiarly on the bowels. It is accordingly as a saline purgative that the Pitcaithly water has been celebrated; and it is principally in those diseases in which this effect is sought to be obtained, that it has been used. The Dunblane water, from the similarity of its operation, would no doubt be employed in diseases of a similar kind. But whatever advantage might be derived from this purgative effect, it cannot fail to be perceived, that a different operation, not less useful, may be obtained from them. If sufficiently diluted, so as to avoid altogether the operation on the bowels, the stimulant operation on the stomach and general system might be exerted by these waters, similar to that of the Bath waters, and under this form they might prove useful in diseases very different from those in which they might otherwise be employed. As they would require, too, large dilution to reduce them to this state, the temperature of the Bath water might easily be given, by adding the requisite proportion of hot water, by which a greater similarity of operation would be obtained. And the Dunblane water in particular, containing so much larger a proportion of iron than the Bath water does, the dilution requisite to give it the same strength, with regard to the muriate of

lime, would still leave an equal degree of chalybeate impregnation. If the preceding observations, therefore, are just, the Dunblane and Pitcaithly waters may be converted, in all the essential parts of the chemical composition, into a water similar to that of Bath.

"From the preceding statement of their composition, it is easy to discover how this may be done. To give the same proportion of the principal ingredient, the muriate of lime, the Dunblane water would require to be diluted with from six to seven parts of pure water; the same degree of dilution would bring it to nearly the same strength with regard to the iron; if a pint of it were diluted with this proportion of water, about 35 grains of sulphate of soda would require to be added, to render the composition, with regard to this ingredient, perfectly alike, if this were thought essential. The only remaining differences would then be, the presence of about 2.8 grains of muriate of soda in each pint of the reduced Dunblane water, the deficiency of 5.5 grains of sulphate, and 0.7 grain of carbonate of lime, and the absence of 0.2 grain of siliceous earth, differences in all respects probably of no importance whatever. The simple expedient, indeed, of diluting one part of the Dunblane water with from six to seven parts of warm water, (or, if the sulphate of lime in a state of solution should be supposed to be possessed of any active power, with four or five parts), and adding, if the chalybeate impregnation were not found sufficiently active, a few drops of tincture of muriate of iron, would probably serve every purpose. And if sufficient confidence could be given to the substitution on the part of those employing these waters medicinally, the Dunblane water, thus altered, might probably be taken with as much advantage as the Bath water in the diseases in which it has been found useful.

"It is obvious, too, that if the artificial preparation of the Bath water were attempted, it could be done much more easily according to this view, than by endeavouring to dissolve the actual products of its analysis, which, indeed, it would be impracticable to do. Muriate of lime, and sulphate of soda, dissolved in water of the due temperature, with the addition of a minute portion of muriate of iron, would probably afford a

composition approaching as nearly to the natural composition, as is either practicable or necessary in the imitation of any mineral water."

In the latter part of this valuable paper, Dr. Murray takes a similar view of some other mineral waters.

The analysis of Cheltenham water "affords sulphate of soda, sulphate of magnesia, and sulphate of lime, with muriate of soda, muriate of magnesia, carbonate of magnesia, and oxide of iron. There is no just reason, however, to infer with certainty, that all these are its real ingredients. It is as probable, and, indeed, more so, that, previous to the evaporation by which they are obtained, it contains muriate of lime, which being acted on by the sulphate of soda, forms muriate of soda, and sulphate of lime. It is even not improbable, that the carbonate naturally existing in the water is not carbonate of magnesia, but carbonate of soda.

"The water of Harrowgate affords in its saline ingredients another illustration of the same views. The principal ingredient is muriate of soda, with which are present muriate of magnesia, muriate of lime, sulphate of magnesia, carbonate of magnesia, and carbonate of lime. Now, nothing is more probable, than that the two last substances are not original ingredients, but are products of the analysis, formed by the action of carbonate of soda existing in the water on portions of its muriate of magnesia and muriate of lime, whence also the quantity of muriate of soda is increased."

Seltzer water, "according to Bergman's analysis, contains, in an English pint,

Carbonic acid gas, - - -	17 cubic inches.
Carbonate of lime, - - -	3 grains.
Carbonate of magnesia, - -	5 ——
Carbonate of soda, - - -	4 ——
Muriate of soda, - - - -	17.5 —

"But, adopting the opposite view, the composition, so far as the uncertainty of the state of the products, to which Bergman's estimate is referred, admits of calculating the proportions, will be,

Carbonic acid gas, - -	17	cubic inches.	
Muriate of lime, - - -	3.3	grains.	
Muriate of magnesia, -	5	——	
Muriate of soda, - -	7.8	——	
Carbonate of soda, - -	10.3	——	dry, or 18 crystallized.

"This view of the composition of this water accords much better than the other, both with its sensible qualities, and its medicinal powers. Its taste, after the carbonic acid has escaped from it, on exposure to the air, is rather strongly alkaline, which would scarcely be the case, if it contained only four grains of crystallized carbonate of soda in a pint, but which is to be expected if it contain eighteen grains. It operates as an antacid and diuretic, and is productive of much benefit in all dyspeptic affections, in diseases of the urinary organs, and in those general affections of the system which require a mild tonic power. There are few mineral waters, Dr. Saunders observes, which have acquired a higher reputation; and there are few, he adds, that deserve greater consideration, from the real medicinal virtues it possesses. It will be difficult to give a satisfactory account of the origin of these virtues, if we regard it as water impregnated with carbonic acid, holding in solution so minute a portion of carbonate of soda, with the larger proportions of muriate of soda and carbonates of magnesia and lime. But if we consider it as containing along with its free carbonic acid, a considerable quantity of carbonate of soda, with smaller proportions of muriate of soda, muriate of magnesia, and muriate of lime, we assign to it a composition of much greater power, and adequate to account for the effects it produces. Such is the activity of this water, that its medium dose is only half an English pint, a degree of power which accords much better with the one view of its composition than with the other."

It is impossible to read these extracts attentively, without being struck with the truth of the views they contain, and the light they throw upon many facts in regard to the action of mineral waters, which have hitherto remained unexplained. We have always considered the change of air, temperate regimen, freedom from care, and pleasant society, to which the

advantage of residence at our various watering places has been ascribed, as inadequate to explain the effects of the waters, compared with the ingredients obtained by analysis; especially when we consider that these effects were, to a certain degree, obtained by the waters bottled, carried to a distance, and used without any of these subsidiary aids. But now, when we see that these very ingredients, which were considered as the most inert, are converted, by Dr. Murray's discernment, into the most active, the cloud which veiled our conception is removed, and every thing seems so plain and simple, that we only wonder that it ever escaped observation.

Dr. Murray's view of the composition of mineral waters does not diminish the value of those analyses which have been accurately made; but it will require them to be subjected to such a calculation, as he has exemplified in several instances, in order to have a clear view of their constituents. It has, however, occurred to us, that the best tabular form of the composition of mineral waters would be to state the quantity of each ingredient separately, as if they existed in simultaneous combination, thus:

Carbonic acid gas.
Carbonic acid.
Sulphuric acid.
Muriatic acid.
Soda.
Lime.
Magnesia, &c.

A Treatise on the Diseases of Arteries and Veins, containing the Pathology and Treatment of Aneurisms and Wounded Arteries. By JOSEPH HODGSON, Member of the Royal College of Surgeons, London. London, 1815.

Engravings intended to illustrate some of the Diseases of Arteries, accompanied with explanations. By JOSEPH HODGSON, Member of the Royal College of Surgeons, London. 1815.

[From the Edinburgh Medical and Surgical Journal, for July 1816.]

THE Royal College of Surgeons in London proposed, as the subject of the Jacksonian Prize for the year 1811, "Wounds and Diseases of Arteries and Veins." There was much propriety in the selection of this most interesting subject; for there is not, perhaps, any other in which the superiority of modern surgery stands more highly displayed; and certainly there is no one in which the skill, enterprise, and science of British surgeons have been more successfully exerted than this. Indeed, we hardly know any thing more brilliant in the history of surgery, than the improvements which have been made, in our own days, by British surgeons, on the operations and treatment of aneurisms, and of wounded arteries. So lately as when we first began our studies, surgeons still hesitated to tie up the main trunk of an artery in the extremities,—and when the necessary attempt proved successful, instead of reckoning their success a thing of course, and referable to the wise and almost unerring provision which nature had made for continuing the circulation in the limb, by the collateral and anastomosing vessels, they conjectured only the existence of a lusus, or higher division of the arterial trunk.

Of the causes of secondary hæmorrhage, of the process of nature in the cure of opened arteries, and of the effect of the ligature which they daily used, their conceptions were still crude and imperfect. We have, not long since, known tapes nearly an inch broad applied to the artery in aneurism, in the fear that such ligatures as the surgeon trusted to in his ordinary operations, should cut and ulcerate the vessel; not to speak of the *serre arteres*, and other ingenious pieces of me-

chanism for keeping the sides of an artery in compressed and flattened apposition, with which the French and Italian surgeons are still amusing themselves.

The British surgeon now knows so well the powers and resources of nature, that there is not an arterial trunk within his reach that he has hesitated to tie; and he has thus successfully thrown a slight and single ligature round the femoral, the carotid, the external, and even the internal iliac artery. He knows now, that a large, broad, and flattened ligature is the worst, precisely for that reason, on account of which it had been thought the best and most secure; and that one of the reasons, for which he now employs a small thread, is to cut and wound the artery he was formerly so anxious to save. He has ascertained, that, by this division of the internal coats of the artery, it becomes permanently closed and cicatrised by adhesive inflammation; that every thing which interferes with this process, and which, instead of it, has a tendency to produce the suppurative or ulcerative inflammation, becomes a cause of secondary hæmorrhage; and, therefore, that the vessel must be separated as little as possible from its attachments; that no foreign body must be interposed for greater security; that the ligature itself should be small, that it may, as a foreign body, offend the least possible; he cuts off one end of it to lessen its bulk still farther; he has even risked cutting away both ends close to the knot, and closing the external wound over it; and he has talked of removing the entire ligature almost as soon as he has tied it, believing that its principal use has been effected when it has divided the coats of the artery, and produced in them a disposition to adhesion. Lastly, instead of slitting open the aneurismal tumour, as was the general practice little more than twenty years ago, he simply secures the artery at some distance above the tumour, and the direct impulse of the circulation being thus interrupted, he trusts to the establishment of a new and devious circulation, and to the consequent condensation and absorption of the aneurismal contents. To all these improvements, British surgery has almost an exclusive claim; and the Jacksonian prize was adjudged by the Royal College to Mr. Hodgson for an Essay, which has laid the foundation of the very excellent treatise now before us. In separate parts, the

author treats in succession, 1*st*, of the dieases of arteries in general; 2*d*, of aneurism; 3*d*, of wounded arteries; and 4*th*, of the diseases of veins. Besides being the subject of inflammation, ulceration, and sphacelation, like other structures, the arteries are liable to other and peculiar morbid changes, to cartilaginous and steatomatous thickenings of their internal coat, and to a deposition of atheromatous and calcareous matter. And these changes are very commonly the forerunners of the more formidable disease of aneurism. But, before entering on the subject of aneurism proper, Mr. Hodgson directs our attention to the cases of preternatural dilatation of the arteries. This disease is different from aneurism, as all the coats of the vessels are uniformly dilated, without any breach of their continuity. Its most frequent seat is the ascending portion and arch of the aorta, though it has been observed in the thoracic and abdominal aorta, and at the divisions of the carotid and iliac arteries. The pouch or sac which is thus formed, is commonly thickened, and covered with atheromatous and calcareous depositions; but this dilatation seldom if ever is found to contain those lamellated coagula which are so generally discovered in the true aneurismal sac; which last, on the contrary, is not often found interspersed with calcareous or ossific deposits like those pouches or dilatations, in which all the coats of the artery are entire. A true aneurism may be, and sometimes is, found engrafted upon a sac of simple dilatation.

Our readers are aware, that the observations of Scarpa have led to the conclusion, that, in aneurism, the formation of the tumour is preceded by a rupture or breach of the internal and middle coats of the artery, and that the sac is formed by the consequent dilatation of the outer coat, and cellular sheath of the vessel.

After having ascertained the fact, therefore, that the whole circle of an artery is found to be preternaturally dilated, in a great many cases, without laceration or destruction of any of its coats, it seems to us a mere affair of arbitrary definition, whether such cases shall be called aneurism or not; and especially, it seems to us, that Mr. Hodgson, after describing this case of preternatural dilatation as a distinct disease, and beginning his section on aneurism with a *definition*, limiting its

interpretation to the case in which the internal and middle coats have given way, would have saved to himself, and to his readers, some little confusion, by maintaining this distinction throughout. Instead of which, he resumes the consideration of dilatation with integrity of the coats of the artery, and reasons upon the subject in a way which leaves us, in some degree, at a loss to know whether he would class it with aneurism or not. Thus, he begins with stating the question, "Does aneurism ever consist in a general or partial dilatation of all the coats of an artery, or is it constantly produced by the destruction of all, or most of the coats?"

That disease, indeed, already described by him in a separate section, and said to consist in a preternatural dilatation of the whole circle of an artery, and not in a partial or lateral distension of its coats, Mr. Hodgson continues to disunite from aneurism. But the case of a partial dilatation of the coats without rupture, he seems inclined to consider as less separable from ordinary aneurism; and he maintains, that, in a great proportion of aneurisms, the disease has commenced in a partial dilatation of the coats of the artery, although, in the progress of the disease, the internal coats do at length give way. In the generality of cases, indeed, he allows with Scarpa, that the formation of the aneurismal tumour is preceded by rupture of the internal and middle coats of the artery. But very many, he contends, have their origin in previous, general, or partial dilatation of all the coats.

"Those aneurisms which are situated at the origin of the aorta, are generally formed by dilatation of the coats of the vessel. The internal surface of the sac, in most instances, exhibits some of those morbid alterations which are peculiar to the internal coat of an artery. The mouth of these sacs is generally larger than any other part of the cavity, and there is not that circumscribed margin between the artery and the sac, which is constantly met with where aneurism is formed by destruction of the coats of the vessel."

Mr. Hodgson has seen this partial dilatation, in almost all the arteries which are subject to aneurism. Such dilatations frequently precede the formation of aneurism in the arteries of the extremities. The cases and observations brought forward

by Mr. Hodgson, as well as the disputes which have always existed amongst anatomists on this subject, leave no doubt as to the existence of these pouches, and dilatations of the coats of an artery without any rupture; and all that our author seems to contend for is, that many aneurisms have their origin in such general and partial dilatation.

"*1st*, Numerous aneurisms are formed by destruction of the internal and middle coats of an artery, and the expansion of the external coat into a small cyst, which giving way from distension, the surrounding parts, whatever may be their structure, form the remainder of the sac. *2dly*, Sometimes the disease commences in the dilatation of a portion of the circumference of an artery. This dilatation increases until the coats of the vessel give way, when the surrounding parts form the sac, in the same manner as when the disease is in the first instance produced by destruction of the coats of an artery."

The original question, however, proposed by Mr. Hodgson, "Does aneurism *ever consist in a general or partial dilatation of all the coats of an artery;* or, is it constantly produced by the destruction of all or most of these coats?" seems thus rather to be gotten rid of, than answered.

It seems, however, to be our author's conclusion, that, although aneurism has often its origin in such dilatation, the case of dilatation ought not to be considered as one of aneurism, till the internal and middle coats of the artery have given way. There is one thing peculiar to this restricted case of aneurism which deserves notice, the deposition of the fibrous portion of the blood in concentrical laminæ upon the internal surface of the sac. "It is almost universally found in aneurisms in which the coats of the artery have given way, but in those sacs which consist in a general and partial dilatation of the coats of the vessel, I have never met with it."

Aneurism, and those diseases of the coats of the arteries which precede its formation, occur much more frequently in men than in women. And the following table exhibits the comparative frequency of aneurisms in the two sexes, in different cases of the disease, in which our author has had an opportunity of seeing his patients during life, or of examining the parts soon after death.

	Total.	Males.	Females.
Of the ascending aorta, the arteria innominata, and the arch of the aorta,	21	16	5
Descending aorta,	8	7	1
Carotid artery,	2	2	
Subclavian and axillary arteries,	5	5	
Inguinal artery,	12	12	
Femoral and popliteal arteries,	15	14	1
	63	56	7

Having considered most of the questions connected with the nature and formation of aneurisms, and having pointed out the symptoms and diagnosis of the disease, Mr. Hodgson gives us some very important and highly interesting observations on the spontaneous cure and medical treatment of aneurism; a subject which, he observes, might, from the bold and successful operations now performed with so much precision, appear superfluous. But the processes of nature are the lights of surgery, and the guides of the operator; and when the disease is beyond the reach of surgery, as in aneurism within the cavities of the thorax and abdomen, the attempts of nature sometimes prevent a fatal termination, and when her processes are understood, they may be assisted by medical treatment.

The processes by which the spontaneous cure of aneurism is effected, are thus stated by Mr. Hodgson.

First, The removal of the whole tumour by sphacelation, in consequence of the extreme inflammation excited by the distension of the surrounding parts.

Secondly, The tumour assuming such a position, as to obliterate by its pressure the superior or inferior position of the artery communicating with the sac.

Thirdly, The gradual deposition of the fibrine of the blood in the aneurismal sac and the artery leading to it, so as to render them impervious, and allow a subsequent process, by which the tumour is removed.

Mr. Hodgson illustrates all those modes of spontaneous cure by cases and observations, and deduces from them the circumstances under which they may respectively take place. The last mode is by far the most frequent and the safest, and

that which art is most capable of assisting. Indeed, in all our operations of aneurism, Mr. Hodgson shows, that it is by this mode the cure is ultimately effected, though the unassisted efforts of nature are sometimes sufficient for the purpose. Numerous instances, he observes, are recorded, in which this process is noticed as having taken place; but its importance in the cure of aneurism, and the circumstances which influence its accomplishment, do not appear to have received that attention which, in a practical point of view, they deserve.

The process consists of the three following stages, according to the result of Mr. Hodgson's inquiry: *First*, The cavity of the sac is gradually filled with layers of coagulum. *Secondly*, The circulation through the vessel is in most instances prevented by the extension of this coagulum to the origin of the next important ramifications that are given off by the artery, from which the disease originates.

Thirdly, The coagulum is gradually absorbed, and the artery and the sac contract, until the one becomes an impervious cylinder, and the other a small fleshy tumour.

Thus, where the circulation can be carried on by the collateral branches, a perfect cure of the aneurism is effected, and life is preserved. But, in internal aneurisms, in aneurisms of the aorta, particularly of the arch or ascending portion of that vessel, the completion of this process in all its steps would not be so fortunate. But here nature proceeds no farther than she can be useful; and Mr. Hodgson, by a selection of cases and observations, has shown, that a deposition of coagulum may take place in an aneurismal sac to such an extent, as entirely to preclude the communication between its cavity and that of the artery from which it originates; that a sac thus filled with coagulum, cannot prove fatal by rupture; and that the gradual absorption of its contents, and the consequent contraction of the sac, may proceed to such an extent as to effect a cure of the disease, without any obstruction taking place in the calibre of the vessel from whence it originated.

A true aneurism commonly communicates with the canal of the artery by a small and lateral opening, the aneurismal sac soon begins to exhibit the formation of those deposits of concentric layers of coagulable lymph;—and, by the successive

considerable conquest. This method has evidently been at first undertaken with the more obvious view of keeping the vessels empty, and lessening the impetus of the circulation upon the aneurismal tumour, and thus postponing at least the fatal rupture of the sac. But in many cases of the result of this treatment upon record, this more obvious indication has not only been answered, but the aneurismal tumour has been observed to subside; to acquire firmness and resistance; to cease to pulsate; and, at length, to retire within the cavity from which it had protruded. We cannot therefore doubt, that, by enfeebling the action of the heart and arteries, and lessening the impetus upon the tumour, we facilitate the deposition of lymph within the sac, thus strengthen its parietes, and eventually promote that process by which the aneurism admits of consolidation and cure. The following case came under our author's observation:

"A soldier, twenty-five years of age, had an aneurism, which pointed on the left side of the chest, near the sternum, in the situation of the fourth and fifth ribs, the cartilages of which were absorbed, and the external tumour was as large as a lemon. The pulsation was extremely violent, and the impediments to respiration were very considerable. Previous to the time when he came into the hospital, he led a dissipated life, and the increase of the tumour had been very rapid. He was repeatedly bled, was placed upon a low diet, and took occasional purges. This plan soon reduced him exceedingly; but, from that time, the tumour ceased to increase, and a livid inflammation which had taken place upon its apex subsided. In a month, the tumour had diminished, and the respiration was much less affected. In three months, no external tumour was perceptible: his breathing, indeed, was difficult, but the inconvenience from this cause was trifling compared with what he had previously endured. Unless he was agitated by passion, or the circulation was accelerated by the use of stimulants, he suffered but little from the disease. In six months, he left us and returned to his trade as a labourer, at which time his breathing was but little impeded. The deficiency of the cartilages of the ribs was very perceptible, but there was no external tumour."

"Pelletan," he observes, "has detailed fourteen cases of aneurism, all of which were materially benefited by this treatment; and in two of them permanent cures appear to have taken place. One man was sixty one years of age, in whom the aneurism appeared on the right side of the chest. "During the first eight days," says Pelletan, "I prescribed eight bleedings, consisting of four porringer-fulls (*pallettes*) in the morning, and two in the evening. On the fifth day, the pain and the pulsation were considerably diminished, but the pulse at the wrist still preserved its fulness. Two porringer-fulls of blood were taken from him; the pulse continued weak until the seventh day, when it again rose. Another porringer-full of blood was taken from him in the morning, and a second in the evening. During this time, the patient was placed upon a rigorous diet. A cold cataplasm, composed of linseed meal and vinegar, was applied to the tumour, and renewed as soon as it became warm. This treatment produced a wonderful effect in eight days; the pain and pulsation disappeared; the debility of the patient did not otherwise injure the state of his health. He observed perfect tranquillity, and did not complain of any uneasiness when the pain and pulsation had entirely vanished. We gratified his extreme desire to be allowed an increase of diet, but this was done by degrees."

"When this treatment had been employed twenty-eight days, the man left Paris. After some months he returned to his business as a porter, grew fatter than before, and continued without any vestige of the disease, except a slight and deep pulsation at the part where the pulsation of the arch of the aorta may be felt in the natural state. Pelletan saw this man daily for two years after the cure was accomplished, when he died of another disease.

"In a very large axillary aneurism, a cure was effected by similar treatment. The size of the tumour, and the effects which it had produced upon the surrounding parts, placed it beyond the reach of operative surgery. A most abstemious diet, consisting only of two basins of broth in the day, and a common drink of lemonade, was prescribed, and twelve porringer-fulls of blood were taken from the arms at six bleedings, in the course of the first five days after his admission into the hospi-

tal. On the second day after the commencement of this treatment, the tumour was less tense and painful. On the third day it was considerably diminished in size, and evidently consisted of two portions, which were separated from each other by the pectoral muscle. On the ninth day it was one-third less in sise than at the commencement of the treatment: the pulsation had ceased, but the patient was reduced to an alarming state of debility. He continued in this state two days, and recovered from it by the use of a more generous diet and a little wine. The pulse returned in the opposite wrist, but not in the aneurism;—the tumour became softer. Powdered ice, inclosed in bags, was applied for twenty days, when a solution of salt was substituted for it. The swelling gradually contracted, and in forty-six days the surrounding parts were easily distinguishable. The limb had recovered its strength and motion; there was no pulsation in the tumour, nor at the wrist of the affected arm; and his general health was completely restored. Some months afterwards there only remained a small knot in the axilla."

Besides the employment of blood-letting, other evacuations, an antiphlogistic regimen, low diet, and digitalis, are also recommended. These have, in some instances, appeared to be useful. Mr. Guerin strongly recommends as an adjuvant, cold applications, and powdered ice to the tumour itself. In a case of inguinal aneurism, in which our author witnessed its employment, it produced such intolerable pain as called for its discontinuance. From the whole of the observations collected by Mr. Hodgson, he thinks himself warranted in the following deductions:

"*1st*, The deposition of coagulum in the cavity of the aneurismal sac, and the artery leading into it, is the mode by which the spontaneous cure of aneurism is, in most instances, effected.

"*2dly*, the coagulum is subsequently absorbed; and the sac and artery contract, until the one becomes an impervious cylinder, and the other a small fleshy tumour.

"*3dly*, In some instances, the cure is effected by the obliteration of the cavity of the sac, without any obstruction taking place in the calibre of the artery, from which the disease origi-

nates. In this manner a cure may take place in aneurisms of the aorta.

"*4thly*, The formation of coagulum being a general occurrence in aneurisms, it is an important object to prevent the increase of the sac, that the deposition of coagulum may proceed to such an extent as to obliterate its cavity.

"*Lastly*, It is the force of the circulation which causes the enlargement of the sac and its ultimate rupture: Hence the diminution of the force of the circulation is the principal indication in promoting the spontaneous cure of aneurisms."

In the next section, Mr. Hodgson proceeds to the consideration of the surgical treatment of aneurism. But as this part of the subject is much more familiar to the English reader than the medical treatment of aneurism, we shall be more brief in our account of it. Every thing, however, connected with this still interesting, and not yet exhausted subject, is not only very fully investigated by our author, but by his judicious observations, and criticism on disputed or more doubtful points, he has, we think, extended the limits of this branch of surgical science.

In the treatment of aneurism, the object of surgery is, to obliterate the calibre of the artery communicating with the sac, so as either at once to prevent the blood flowing into it, or at least to diminish the volume and force of its current, so far as to prevent the increase of the tumour, and to promote the coagulation and absorption of its contents,—while the blood passes on through new channels by means of the collateral branches. The obliteration of the main artery is attempted by compression or by ligature. There is no reason to doubt that cures have been promoted by different modes of compression. General compression of the limb, with a system of abstinence and depletion, may have assisted the spontaneous cure of aneurism. The attempt to compress more completely and entirely the artery feeding the aneurismal tumour, is now superseded by the improved mode of operating introduced by Mr. Hunter, and, since his time, brought to a very high degree of perfection by our own surgeons. There are three points connected with the operation of aneurism which claim particular attention. *1st*, The application of the ligature. *2dly*, The mode by

which the blood is conveyed through collateral channels to the parts which it is destined to supply. And, *3dly*, The changes which take place in the tumour, in consequence of the ligature of the artery, at a distance from the disease. All these subjects are discussed in a very able and luminous manner by Mr. Hodgson. The experiments of Dr. Jones, confirmed and extended by succeeding observations, have thrown a new light on the action of the ligature, and have led to some important improvements in its application.

"Instead of simply producing an approximation of the opposite sides of the vessel, it has been ascertained by an extensive series of experiments, that the application of a ligature to an artery is the performance of a distinct operation upon it, producing a wound in its internal and middle coats, which gives rise to an effusion of lymph, whereby the opposite surfaces of the extremity of the vessel are united, in the same manner as soft parts in general are healed by the adhesive inflammation. The immediate effect of the ligature is the obstruction which it affords to the passage of the blood through the vessel; but its more important results are, the adhesion and obliteration of the extremity of the tube. The processes by which these objects are accomplished are the following: The internal and middle coats are cut through by the ligature, and are thus placed in the condition of simple incised wounds. From these cut edges an effusion of lymph takes place, which seals the extremity of the tube, forming a matrix for vessels, which extend from the wounded surfaces, and unite the opposite sides of the canal in that situation. At the same time the inflammation, excited in the coats of the artery, produces an effusion of lymph between them, with which they are thickened; and, from the surrounding parts, a similar effusion takes place, which covers the vessel externally, and affords it additional support. The ligature causes the death of that portion of the external coat with which it is in immediate contact. In a little time this slough is detached by ulceration, and the ligature is cast off. But the recent adhesion at the extremity of the vessel would probably be too weak a barrier to the impulse of the circulation, especially in the larger arteries, if the portion of the vessel between the ligature and the next collateral branch

were not, in most instances, filled with the coagulum of the blood, which, in this situation, meets with an obstacle to its progress, and is placed, as it were, out of the course of the circulation. The coagulum deposited from the blood, under these circumstances, forms a plug, which removes the impulse of the circulation from the recently cicatrized surfaces. This plug, however, serves but for temporary purposes. It is gradually absorbed; and that portion of the vessel which is situated between the ligature and the next collateral branch, contracts, and ultimately degenerates into a simple ligamentous cord.

"Such are the processes which Dr. Jones ascertained to follow the application of a ligature to an artery, differing from his account of them only in this point, that the ligature is here stated to cause the sloughing, and not the ulceration of that portion of the external coat which it immediately embraces. This circumstance I have inferred from the examination of several arteries which have been tied in the human subject as well as in brutes; and from having observed that, after several operations for aneurism, in which the vessel was not divided, the ligature brought with it, in its ring, a considerable portion of slough of a cellular structure, accurately resembling the external coat of an artery."

One of the most distressing occurrences, after the operation of aneurism, has been that of secondary hæmorrhage. The causes of this, however, are now better understood; and, in so far as these can be avoided, or their effects prevented, the surgery of aneurism is now in a very improved state. The principal causes of secondary hæmorrhage are the obstacles which the adhesive inflammation has met with, in consequence of, *1st*, a morbid condition of the coat of the artery; *2dly*, the application of an improper ligature; *3dly*, its premature removal; and *4thly*, sloughing or ulceration of the vessel and surrounding parts.

Having examined at length the operation of these causes, and explained the mode in which they are most likely to be obviated, Mr. Hodgson sums up the whole in these conclusions:

"*1st*, The cord should be thin and round, such a ligature

being most likely to effect a clean division of the internal and middle coats of the vessel, and not liable to occasion extensive ulceration or sloughing.

"*2dly*, The ligature should be tied very tight, in order to insure the complete division of the internal and middle coats, and to prevent its detachment, it being almost impossible, even with the thinnest ligature, entirely to cut through a healthy artery.

"*3dly*, The vessel should be detached from its connexions, only to such an extent as is necessary for the passage of the ligature underneath it.

"*4thly*, The immediate adhesion of the wound should be promoted by all those means which assist that process in general.

"*Lastly*, Experience having proved that secondary hæmorrhage more frequently arises from an improper mode of tying the artery, or of treating the wound, than from the condition of an undivided artery, the practice of applying two ligatures, and dividing the vessel in the interspace, is not an essential object. But in situations where there is a vigorous circulation at both ends of the vessel, the application of two ligatures is advisable."

When the main artery, supplying the aneurismal tumour, has been tied, the blood passes through the collateral and anastomosing branches to the lower part of the limb; and so extensive is this provision for carrying on the circulation, independently of the principal arterial trunks, that, with the exception perhaps of the ascending aorta and its arch, there is not an artery in the body which may not be tied with the utmost confidence, that the parts beyond the ligature will continue to be supplied with blood by anastomosis. The descending aorta itself forms no exception to this rule. It has been tied in brutes, and it has been found obstructed in man. There are, indeed, circumstances in the condition of the part operated on, or in the general health of the system, which may prevent the full establishment of collateral circulation. In particular, extensive disease of the arteries themselves may have this effect; or previous wounds, or the bulk of the aneurismal tumour, destroying or pressing upon the principal anastomoses, may also

interrupt it. A languid state of the circulation, such as exists in old and infirm habits, is also adverse to the enlargement of the anastomosing branches. When the collateral circulation fails from any of these causes, the limb sphacelates and dies. But, generally,

"*First*, When the circumstances tending to prevent the establishment of a collateral circulation do not exist, we need not apprehend the death of any part in consequence of a deficient supply of blood after the ligature of its main artery.

"*Secondly*, The circulation will be as effectually carried on in a healthy limb, when the main artery is suddenly tied in consequence of a wound, as when an aneurism has existed for a considerable time.

"*Lastly*, The practice of permitting an aneurism to increase, that the collateral branches may become enlarged, is not only unnecessary, but injurious, inasmuch as that the increase of the tumour must be attended with a destruction of the surrounding parts, which will render the cure of the disease more tedious and uncertain."

The effects produced on the aneurismal tumour by the ligature of the arterial trunk, from which it originates, are the interruption to the passage of the blood immediately through it; the consequent cessation of pulsation; the coagulation of its contents; their gradual absorption; and the complete obliteration of the cavity of the sac.

"But when the artery is tied at a distance from the disease, the ingress of the blood is not altogether prevented, for the anastomosing branches which open into the trunk below the seat of the ligature, convey a stream which passes through the aneurism. The impulse of this current is, however, so trifling, that the enlargement of the sac not only ceases, but the deposition of coagulum in it increases, in consequence of the languid state of the circulation. The coagulum accumulates until the cavity of the sac and the mouth of the artery, leading into it, are obliterated. By the absorption of the coagulum, and the contraction of the sac, the cure is ultimately accomplished, in the same manner as when the artery is tied close to the tumour, or the disease is remedied by the spontaneous efforts of nature.

"That a stream of blood, in most instances, passes through the sac after the ligature of the superior part of the artery, at a distance from the disease, is confirmed by numerous observations, and is a fact of great importance, both in a practical and pathological point of view. It is proved, 1*st*, By the occasional recurrence of pulsation in the tumour after the operation; 2*dly*, By cases in which the cavity of the sac has been exposed, and hæmorrhage has been the consequence; and, 3*dly*, By dissections, in which it has been found that the cavity of the aneurism, as well as that of the artery from which it originated, was pervious from the part which was obliterated by the direct operation of the ligature."

The artery itself, after it has been tied, gradually contracts, loses its calibre, and, some time after, is found to be consolidated, and converted into a ligamentous cord, to some extent, both above and below where the ligature had been applied, generally to the sending off of some principal collateral branch by which the circulation is continued through the limb.

"In the preparations," observes our author, "that I have examined, and in all the cases that I have met with upon record, in which the parts were dissected, after a complete and radical cure of aneurism was effected in consequence of the modern operation, the cavity of the sac has been obliterated, and the only vestige of the disease which remained was a solid ligamentous substance. Both extremities of the artery from which the aneurism arose were also obliterated to the origin of some important branch. In Mr. Astley Cooper's case, the femoral artery was converted into a solid cord, from the origin of the profunda to the commencement of the tibial arteries. This, however, is the only instance with which I am acquainted where so extensive an obliteration of the artery had taken place. In all the other dissections after the modern operation for popliteal aneurism, that I know of, the femoral artery has been found to be obliterated for the space of three or four fingers' breadth at the place where the ligature was applied; below that part it was pervious, and continued so for some distance, when the obliteration again commenced, and continued throughout a considerable extent of the popliteal to the origin of the inferior articular or tibial arteries. Thus,

as it were, an insulated portion of the femoral artery preserved its cavity, which was terminated above by the part which had been obliterated by the ligature, and below by the part which had become impervious, in consequence of the effects of the operation upon the aneurism in the ham. From each extremity of this insulated portion of artery which still preserved its calibre, considerable anastomosing branches arose, the upper branches conveyed blood into the vessel, and the lower transmitted it into anastomosing channels that originated below the knee. A double collateral circulation, therefore, existed in the limb, namely, one by which blood was conveyed from the branches of the profunda into the femoral artery, which was pervious below the part obliterated by the ligature; and a second, by which it was forwarded from this insulated portion of the vessel into the trunks of the leg through the articular arteries of the knee."

The existence of an aneurism in a situation where it is impossible to tie the artery above the tumour, has suggested the experiment of securing, in such a case, the artery below the tumour, in the expectation that an impediment would be given to the free passage of the blood through the aneurismal tumour, sufficient to occasion a stagnation and coagulation of its contents. This practice, originally proposed by Dessault, was tried by Deschamps in a case of inguinal aneurism. The experiment was unsuccessful; and Mr. Hodgson conjectures that a branch had opened between the ligature and the tumour, by which it continued to be supplied. This operation has also been performed in London.

"Mr. A. Cooper was consulted in a case of aneurism of the external iliac artery, which extended into the abdomen as high as the internal iliac, so as to render it impracticable to tie the artery above the tumour. The disease had thrust forwards the inferior portion of the abdominal muscles and Poupart's ligament. The rapidity of its progress threatened the life of the patient. The femoral artery was tied between the origins of the epigastric artery and of the profunda. The pulsation continued; but the tumour did not increase in size after the operation. The ligatures separated favourably. The aneurism diminished so considerably, that it was conceived, in a little

time, if its diminution continued, it would be possible to tie the external iliac artery above the tumour. The patient went into the country to recruit his general health, where the aneurism burst underneath the peritoneum, and he died in consequence of the extravasation of blood into the cellular membrane of the pelvis and scrotum. In this instance the femoral artery was tied below the origin of the epigastric and circumflexa ilii arteries; a current, therefore, continued to pass through the sac into these vessels; consequently the blood was not at rest in the aneurism, and did not coagulate. After the ligature of the artery, the blood was transmitted more readily through the internal iliac than through the arteries which originated below the aneurism, namely, the epigastric and circumflexa ilii. The contraction of the sac, therefore, appears to have been the consequence of the diminution of the stream which passed through it, in the same manner as an aneurism contracts, although a current enters it after the ligature of the artery, at a distance from the disease. It is to be regretted that, in the instance which I have now related, an opportunity could not be obtained of examining the actual condition of the parts after death."

Notwithstanding the failure of these cases, Mr. Hodgson concludes, that the effect of tying an artery below the aneurism has not yet been determined by experience. "There is strong reason," he observes, "to believe that if no branch originated from the aneurism, or from the artery below the aneurism, the blood would coagulate in the tumour, and that a cure would be accomplished by the absorption of this coagulum, and the subsequent contraction of the sac." The principle upon which a cure is expected to follow this mode of operating, is the same as that upon which varicose veins are cured by tying the superior part of the vessel. The obstructed blood coagulates in the dilated vein,—the coagulum is absorbed,—the cyst contracts, and the disease is cured.

Having at great length, and with much acuteness and intelligence, investigated the pathology of aneurisms in general, Mr. Hodgson closes this part of his subject by invoking the reader's attention to the identity of the processes, by which a spontaneous cure of aneurism is occasionally accomplished,

and the effects produced upon the disease by the modern operation.

"If the patient be feeble, and the circulation languid, the cavity of the sac is gradually filled with strata of coagulum deposited from the blood which passes through it; by the absorption of this coagulum, and the contraction of the sac, a cure is ultimately accomplished. If a languid state of the circulation be induced by abstinence and depletion, these processes of spontaneous cure are promoted.

"If the artery be tied above an aneurism, the ingress of blood into the tumour is not entirely prevented; but the stream which passes into it from collateral branches, is not sufficient, either in quantity or in force, to continue the disease. Under these circumstances, the deposition of coagulum is promoted by the languid state of the circulation through the tumour. The cavity of the sac is gradually filled, and the same processes of absorption and contraction ensue, as when the disease undergoes a spontaneous cure.

"The cure of aneurism in general, whether effected spontaneously, or by the assistance of art, is therefore referable to one principle,—the diminution of the force of the circulation through the sac:—All which art can with safety accomplish, is to place the parts in a condition in which the powers of the economy are capable of remedying the effects of disease."

Our author now proceeds to investigate the history of particular aneurisms;—and, in distinct sections, he gives a very minute and detailed account of every thing connected with the formation, progress, termination, and treatment of each variety. But here it is not our intention to go into details. It is sufficient to remark, that, under the heads of carotid aneurism, —axillary and subclavian aneurisms,—brachial, radial and ulnar aneurisms,—inguinal aneurism,—gluteal and ischiadic,—femoral, popliteal, and tibial aneurisms, the reader will be gratified with a variety of interesting cases and observations, and by an account of those brilliant operations which reflect so much honour on modern surgery. The subject of wounded arteries, including the processes of nature and of art for the suppression of hæmorrhage, is also discussed with much ability by Mr. Hodgson. His observations on the diseases of veins

are no less worthy of notice, and we regret that our limits, already transgressed, do not permit us to introduce our readers to at least a superficial acquaintance with them. The diseases of the veins are respectively considered under the heads of inflammation of the veins,—morbid changes of their coats,—and varicose veins. There is also a section on the obliteration of veins, and venous collateral circulation, highly deserving a careful perusal. To conclude; we can, with great confidence, recommend this volume to the attention of our readers, as embodying a great variety of fact and illustration, and presenting a very faithful and interesting record of the improved state of science and of art in pathology and surgery.

Researches on Pulmonary Phthisis from the French of G. L. Bayle, D. M. P. By WILLIAM BARROW, M. D. Senior Physician to the Fever Hospital, Lunatic Asylum, and Workhouse, Liverpool. Liverpool, 1815.

[From the Edinburgh Medical and Surgical Journal, for July 1816.]

THIS is a very good book, although the extravagant praise with which it is introduced to our notice by the translator, almost prepossessed us against it. But a translator must be looked upon as a lover, who has eyes only for his mistress, and thinks " this present age yields not a woman worthy to be her second." We readily admit, that "the indefatigable industry and perseverance of M. Bayle, his unassuming modesty and candour, the perspicuity and genuine philosophy he has displayed, certainly entitle him to the esteem and respect of every country;" but Don Quixote was less unsuccessful in getting the transcendent beauty of his Dulcinea acknowledged, by force of arms, than Dr. Barrow will be in his attempts to convince the pupils of the London and Edinburgh schools of the right of France to exult, even " at present, in her claim to pre-eminence, either in pathological or practical knowledge," or "to boast that one of her physicians has done more towards esta-

blishing an accurate knowledge of disease of the lungs, than had been effected in *other* countries (Why other countries only? Why except France itself from the censure?) in two thousand years."

We agree perfectly with Dr. Barrow on the great value of morbid anatomy, and lament with him most sincerely the obstacles which exist in this country to pathological investigation, even in our public hospitals; but we do not agree with him in conceiving that legislative interference would produce much good in regard to this matter. The coroner might indeed be *required* to examine the body in all cases which come under his consideration, a duty which at present is often culpably neglected, and some facilities might be afforded for the keeping of correct bills of mortality and parish registers; but Dr. Barrow's notions of obliging the faculty attached to public hospitals, to keep correct registers of practice, and of regulating the opening of the dead by law, are perfectly chimerical. It is only by removing the prejudices of the people, and by encouraging the zeal of the profession, that any progress is to be made.

In illustrating the advantages to be obtained from dissecting the dead, Dr. Barrow mentions a very curious and important fact, which we regret he has not detailed more circumstantially, although not connected with pulmonary phthisis.

"Some time ago a very alarming disease broke out amongst the children in the workhouse. It was observed to commence in the most sudden manner. The little sufferers were seized with vertigo, without any previous indisposition, and instantly fell to the ground: a very languid state and stupor, from which it was difficult to rouse them, quickly followed. The first that was affected did not excite alarm in the apothecary then in attendance, and he ordered the usual means for clearing the bowels: the child, to his great astonishment, continued in a comatose state, and died in the afternoon of the same day. This circumstance being represented to the church wardens, they interrogated him very closely; and though, in this instance, very little to blame, he was severely censured. In a day or two after, another child was seized in the same manner, of which I had immediate notice; and having already had a melancholy

account of the formidable nature of the disease we had to contend with, I prescribed powerful antimonial emetics, to be repeated every ten minutes till they produced a copious effect. The little patient was then put into a warm bath, and afterwards wrapped in blankets, to effect a profuse perspiration; during which I directed the nurse to awake him every three or four hours, for the purpose of giving a couple of pills of calomel and antimonial powder, to be washed down with a mixture of infusion of senna and salts, and this course to be repeated as long as the coma lasted. This plan having succeeded, the child got well. More of the children, however, continued to be attacked each day, and being treated in the same manner, all, except one, recovered. This child, after showing symptoms of amendment, relapsed two or three times, and died. I took the opportunity of examining the body very minutely, but could find nothing in the brain or stomach to throw any light on this singular disorder. In the heart alone could I discover any morbid change, and here were strong appearances of inflammation, particularly in the aortal valves of the left ventricle. Having obtained this proof of the nature of the disorder, I was enabled to proceed with confidence in place of the timidity and diffidence I felt previous to the dissection, and though more than 200 of the children were attacked, this dangerous disorder was not fatal in any other instance."

We do not think Dr. Barrow warranted to infer, from finding the aortal valves of the left ventricle inflamed in a single instance, that the inflammation of these, or even any part of the heart, occurred in all the two hundred attacked, unless some symptoms, indicating disease of this organ, had been observed in all or most of them.

The translation is, upon the whole, correct. We noticed, however, some errors, as *commissioner*, repeatedly, for *porter*. Its style may be judged of by the extracts we have made.

M. Bayle, in the first part of his work, treats of the essential character of phthisis; of the diseases which have been confounded with phthisis; of the different kinds of phthisis; of the different periods of phthisis; of the state of other parts of the body in those who die of phthisis; of the complication of phthisis with other diseases; and, lastly, of the treatment. These

subjects occupy 130 pages; the remaining 370 contain the histories of particular observations, with dissections and remarks.

M. Bayle, in establishing his essential character of phthisis, disregards entirely those symptoms by which it is commonly recognized during the life of the patient, and deduces it solely from a pathological state of the lungs. In his opinion, "Every organic affection of the lungs which, left to itself, produces their progressive disorganization, succeeded by their ulceration, and finally by death, ought to be considered as phthisis pulmonalis." This definition limits the commonly received idea of phthisis in some respects, and extends it in others. It excludes all diseases, in which there is no actual disorganization of the lungs, however much they may resemble phthisis in their symptoms, and it includes all incurable disorganizations of the lungs, however different in their nature, as soon as they commence, and therefore before they have produced any symptoms to denote their existence.

His particular view of this disease renders it necessary to distinguish it from some other affections, which are united with it, when the subject is differently considered. These are, 1*st*, *Chronic pulmonary catarrh*, when it proves fatal; the catarrhal phthisis of authors. M. Bayle indeed candidly admits, that in its symptoms, especially when accompanied by puriform expectoration and hectic fever, it is very nearly allied to phthisis, but considers it as an essentially different disease, as it only affects the mucous membrane of the lungs, does not disorganize them, and has no tendency to destroy their substance. 2*dly*, *Chronic peripneumony*, which indurates the lungs, gives them somewhat the appearance and consistence of muscle, but does not produce ulceration. One variety of this affection is called *Engouement du poumon*, when the lungs are a little firmer than usual, very heavy, and pouring out from all parts an astonishing quantity of blood, serum, and frothy mucus, without tubercles or ulcerations. 3*dly*, *Chronic pleurisy*, especially when it is not accompanied by any local pain, and when it produces effusion, purulent expectoration, hectic fever, cough, and the highest degree of marasmus. On opening the thorax, the lungs on one side sometimes seem to be altogether

destroyed, or converted into a purulent fluid; but, on accurate examination, they will be found entire, and contracted into a very small bulk. In other cases, the lungs will seem to contain a very large cavity filled with pus, when, in fact, the pus is not in the substance of the lungs, but effused in the space between two of their contiguous lobes adhering by their edges.

M. Bayle next proceeds to describe the various affections of the substance of the lungs, which, in his opinion, constitute phthisis pulmonalis; and of these he has observed six, which sometimes occur without complications, but frequently combined with each other, or with other affections. This view leads him to divide phthisis into six species; 1. tubercular; 2. granular; 3. with melanosis; 4. ulcerous; 5. calculous; and 6. cancerous.

Tubercular phthisis is often simple. The tubercles are formed by a homogeneous substance, always opaque, of a white or dirty white colour; at one time yellowish, at another grayish. Some are very distinctly encysted; the surface being commonly membranous, but in some cases cartilaginous, or even bony. Others adhere to the parenchyme of the lungs, by continuity of substance, and are commonly marked by some black lines. Both kinds are penetrated by capillary blood-vessels, and both often occur in the same person. They vary in size from a millet seed to a chesnut, and are sometimes excessively numerous, and at others there are only two or three in number. They are at first very firm, then grow soft in the centre, which is transformed into a grumous purulent matter; and in the end they are totally destroyed by suppuration. The ulcers arising from the suppuration of tubercles are almost always covered by a distinct membrane which secretes pus, or by an albuminous layer, unless where the substance of the lungs is ulcerated. When there are several ulcerations, they communicate with one another by irregular openings, and form in the lungs rugged cavities, sometimes of great extent. With the bronchi they communicate by round openings. The substance of the lungs is sometimes almost sound around the ulcerations when they are very small, but commonly it is more or less altered. Usually it is not ulcerated, although sometimes it seems to

have almost entirely disappeared, from the compression caused by the tubercles. Sometimes there is a complication of the tubercular with ulcerous phthisis; in which case, ulceration of the substance of the lungs is the consequence of the suppuration of a portion of it, which had become inflamed at the time when the softening of a contiguous unencysted tubercle took place.

Granular phthisis has not been described. The lungs are stuffed with miliary granulations of a cartilaginous nature and consistence, transparent, shining, sometimes speckled with bright black lines or points. They vary in size from a millet seed to a grain of wheat. They are never opaque, and never dissolve, but at last occasion ulcerations of the parenchyme of the lungs; and in this case, there is always an evident albuminous layer lining the ulcer, and even often a distinct membrane, which secretes the pus. It is almost always complicated with tubercular phthisis.

Phthisis with melanosis has been observed, but not understood. It affects only adults, and, above all, persons advanced in years. Those whom it kills have ulcers in the lungs of various sizes, as black as coal, and very hard; sometimes a few lines thick, and sometimes as many inches. The parts remote from the ulceration are commonly very sound; but if the disease affects an entire lung, it is hard, compact, black as ebony or charcoal, and sometimes like half-burnt leather. It is commonly complicated with tubercular or granular phthisis, or even other species, and also occurs without complication.

Ulcerous phthisis is very rare. When absolutely without complication, the ulcer takes place in the very substance of the lung, and is never covered by an albuminous layer, nor by any distinct membrane; or in ulcers which are the consequence of tubercles. It almost always exhales a very fetid and gangrenous smell. Its surface, which is very unequal and irregular, is commonly covered with decayed substance of a brown colour, or with grayish, brownish, or even blackish purulent matter of a pungent offensive smell. These are generally the traces of hæmorrhage. The structure of the part where the ulcer is situated becomes closer, but sometimes without tenacity; at others firm, while the lung at a little distance is quite sound. The

size of the ulcer is very variable, and sometimes there is only one deep seated ulcer. Ulcerous phthisis is commonly quite simple. When it is complicated with other species, there are almost always several excavations communicating with one another. In calculous phthisis, the lungs contain calculi or ossified particles, sometimes in great numbers. They are almost always situated in the bronchial glands, or in small cysts, and sometimes between the bronchi or the first divisions of their ramifications.

Calculous phthisis is sometimes simple, but more frequently complicated with other species, and it occurs sometimes in persons subject to gout or nephritic colic.

In cancerous phthisis the part is of a glossy white, sometimes firm, at others already in a soft state, and always with extremely minute blood-vessels running though it. The cancerous masses are sometimes insulated, at others occupy the parenchyme of the lung. This species is commonly the consequence of a cancerous diathesis. It sometimes occurs single, sometimes complicated with tubercles or melanosis. This is fungus hæmatodes affecting the lungs.

Much as pathological anatomy is to be esteemed, and zealously as it ought to be cultivated, it is from its ultimately enabling us to form, in the first place, a just diagnosis of resembling diseases, and then of establishing a scientific treatment of each, that it derives its practical value. Admitting, then, that M. Bayle is right in his anatomical observations, and we would not willingly object to their excessive minuteness or subdivision, let us next consider the symptoms by which each of his species is to be recognized during life. We may premise that M. Bayle has added to the three stages into which the progress of phthisis is usually divided, an occult stage, where the organic change has taken place, but as yet has not given rise to any of the symptoms which would inevitably have followed, if the patient had not been cut off by another disease.

The first obvious degree of tubercular consumption varies much both in its symptoms and in its duration. It often begins with a dry cough, frequently preceded by some other disease, as spitting of blood, inflammation of the chest, an eruptive fever, or cold. A mucous expectoration then takes place, in

which opaque white threads, or sometimes little lumps like rice much boiled, and sometimes streaks of blood, are to be seen. These succeed slight accessions of fever in the evening, flushing of the cheeks, and burning palms of the hands. It gradually passes into the second degree. Hectic fever commences, the wasting makes progress; constipation and sleeplesseness, as well as night sweats, sometimes supervene. The third degree begins in a few months, or not until a year or two afterwards. The hectic fever experiences only slight intermissions; night sweats, diarrhœa, aphthæ, expectoration and cough, exhaust the patient. In this stage, traces of pus are often, but not always, to be found in the expectoration; which, however, in the greater part of phthisical patients, is nothing but an increased secretion from the mucous membrane of the bronchi.

In granular phthisis, hæmoptysis, more or less abundant, or an habitual sense of oppression, is often the first symptom; or it commences with an obstinate dry cough, or a catarrhal affection, accompanied with transparent glairy expectoration. Chronic pulmonary catarrh, hectic fever, and marasmus, precede death, if it be not previously caused by hæmorrhage.

Phthisis with melanosis is slow and long, without any alarming symptoms. Moderate cough; expectoration whitish, rather opaque, round, of much consistency, and floating in water; sometimes vomiting from the cough; little affection of the chest; the sleep disturbed by the cough; slow but very great marasmus, with a pulse a little more quick than natural; sometimes œdema of the legs are the symptoms commonly observed.

Ulcerous phthisis is attended in its first degree with cough and expectoration; at first ropy, afterwards containing strings of blood and streaks of pus. Pains arise in the chest; after which the expectoration becomes manifestly purulent and fetid, and sometimes there is severe hæmoptoë. The hectic fever is constant and well marked, with burning heat.

Calculous phthisis is recognised by the spitting up of concretions of a whitish or grayish colour, after having had a dry cough for a length of time.

Cancerous phthisis is very slow. Difficulty of breathing and slight cough; occasional pains in the breast, more or less un-

supportable, succeeded by expectoration more or less copious, and sometimes very white; and the skin commonly assumes a pale yellowish colour, like that of persons affected with other cancerous complaints.

Such are the symptoms most commonly observed in each species of phthisis, according to M. Bayle, when they exist in their simple form; and it is evident that the diagnosis is even then attended with very great difficulty; but when we consider that two or even three species sometimes exist together, we must anticipate that an accurate and certain diagnosis will be possible in a very few cases only. But the concurrence of several species of degeneration in the same individual naturally suggests a doubt that they do not differ in kind, but only in form; and that M. Bayle has only subdivided the tubercular phthisis of authors into several varieties, in distinguishing it into phthisis with tubercles, granulations, melanosis, and calculi. The ulcerous and cancerous phthisis appear to be sufficiently distinct. But the difficulty of the diagnosis is still farther increased by the numerous diseases with which phthisis is complicated, so that some are suspected of having been the cause of the phthisis, when, in fact, they only accelerated its progress, and others prove fatal chiefly in consequence of the pre-existing disorganization of the lungs. These diseases are exanthematous fevers, peripneumony, pleurisy, pulmonary catarrhs, acute or chronic, hæmoptysis, diseases of the heart, and syphilis. The effect of these complications is well explained by M. Bayle.

"There is still a question of importance to be discussed here:—When phthisis shows itself after pleurisy, hæmoptoë, chronic peripneumony, or even after a prolonged pulmonary catarrh, can we not, or ought we not to presume that the phthisis has been produced by the chronic inflammation of the lungs?

"This question is of the more importance, since many able physicians have regarded pulmonary catarrh as the most frequent cause of phthisis; and have even asserted that rheum, by the consequences it produces, destroys more persons than the plague.

"In order to answer the question we have just stated, it is sufficient to call to mind the following facts:—

"1*st*, I can assert, that of a thousand persons there is not

perhaps one who dies of a chronic pulmonary catarrh uncomplicated. What has occasioned the protracted rheum to be regarded as a dangerous disease is this, that they have confounded with pulmonary catarrh different affections which are accompanied with some symptoms analogous to those of rheum. The affections which have misled them the most frequently, are phthisis at the first stage, consumptions much prolonged, chronic peripneumony, and lastly, acute peripneumony complicated with chronic pulmonary catarrh. When the error in the diagnostic attaches to these two last complications, it is easily rectified, provided the authors who have fallen into this error have given exact descriptions of the diseases they speak of: it is sufficient that we read the dissections they report. In spite of the kind of prepossession that the idea of a simple pulmonary catarrh has given them, they say the lung was hardened, carnified, rendered liver-like; or they employ other analogous expressions, which designate the state of lungs affected with acute or chronic peripneumony, whilst in the simple chronic pulmonary catarrh the lung is not either carnified or hardened: we observe only a slight thickening of the mucous membrane of the air passages, which exude a great quantity of mucous matter. This thickening and this mucous matter are very visible, whether it be in subjects which perish from simple pulmonary catarrh, or in those who, having a chronic pulmonary catarrh, become the victims of some other disease.

"2*d*, Numberless tubercles are observed in subjects who, having been ill only a few days, have died of peripneumony, of pleurisy, of spitting of blood, or of some other acute disease.

"3*d*, The lung is frequently found to be without ulceration or tubercles after chronic peripneumony, after chronic pleurisy, after hæmoptoë frequently repeated, and after chronic pulmonary catarrh of the most obstinate kind. These observations show that if, in some analogous cases, the lung is tuberculous, or filled with miliary granulations, it is because there were two diseases. Besides, in the instances of this complication, the tubercular disease might easily have preceded the inflammation.

"4*th*, Tubercular degeneracy being a very frequent chronic disease, which does not prevent other diseases, and which

even produces some, it is not surprising that tubercles are met with in many persons who have had a chronic inflammation of the chest. For when a hæmoptoë, a pulmonary catarrh, a pleurisy, a peripneumony, or any other inflammatory disease, attacks an individual who has miliary granulations, or a tubercular affection of the lungs, the granulations and tubercles, by continually stimulating this organ, rendered more sensible by a phlegmasy, contribute to keep up the inflammatory disposition. They render the inflammation chronic, which ought to have terminated favourably in a few days; and amongst the inflammations which ought to follow a chronic course, tubercles make incurable or fatal the greater part of those which, by a well-understood treatment, might, without this deadly complication, terminate in a cure. In order the better to perceive this truth, we will examine the influence of tubercles and miliary granulations of the lung in cases of inflammation of the pleura, and we shall see how much more dangerous this inflammation is when it is complicated with a previous degeneracy in the organ of respiration.

" Inflammation of the pleura in a slight degree is very common, since there is scarcely a dead body in which some adhesion of the lung with the contiguous parts does not occur. Besides, these adhesions, as all the world knows, arise from inflammation alone. It is nevertheless rare that the slight degree of phlegmasy, sufficient for the formation of accidental membranes, is sufficiently intense to occasion the symptoms of pleurisy. This slight inflammation of the pleura easily gets well when not kept up by any particular cause. This is not the case if the lung be already affected with granulations or with tubercles, whatever be their nature and quantity. When this coincidence takes place, the inflammation of the pleura and the phthisis have a reciprocal influence, and the patient dies. On opening the body, we find the pleura inflamed, and the lung tuberculous. But we must not conclude from this that the pleurisy produced the tubercles; it only accelerated the progress of those which had a tendency to grow soft and to suppurate. We likewise see chronic pleurisies of long duration without tubercles in the lungs; and meet with numberless tubercles in subjects where the pleurisy, though chronic, has not been of long duration. We may even affirm in general, that simple chronic pleurisy is commonly

of very long duration; and when it is complicated with tubercles, death, as we have already mentioned, is more rapid in proportion as the tubercles are more numerous. Lastly, in chronic pleurisies there are often tubercles in both lungs, though the pleurisy only affects one side of the chest; and frequently tubercles are most numerous on the side where the pleura was not inflamed; at other times, there are no tubercles but in the lung of the side opposite to the pleurisy, or even there are tubercles in the mesentery as well as the lung. These facts prove that the developement of tubercles depends on a general diathesis, and not on local irritation.

"*5th*, Tubercular affection is very probably of a scrofulous nature, as M. Portal seems to me to have proved in his treatise on Phthisis Pulmonalis. Some other authors also are of the same opinion. Besides, the scrofulous taint is a particular affection which is not the effect of any inflammatory state, not even chronic; and this degeneracy does not show itself in those who are not scrofulous, even when they are affected with a phlegmasy either acute or chronic.

"These different considerations appear to prove, that inflammatory affections are much more rarely, than is imagined, the decided causes of phthisis. Besides, as I have already said, if these inflammations occasioned this disease, the greater part of them ought to produce the ulcerous phthisis; yet it is precisely the contrary, as I have constantly observed. It is always the tuberculous phthisis that is met with in examples which are adduced in favour of the production of phthisis by acute or chronic inflammation. We have only to consult in the different treatises on phthisis the facts relating to it, in order to be persuaded, even to conviction, that these also, like those which I have observed, ought to be referred to tubercular phthisis."

M. Bayle's opinion that phthisis is almost always incurable and fatal, is calculated to depress all endeavours to discover a method of cure; but our attention must not be relaxed; for he adds, truly, that it is often confounded with other diseases, some of which are easily cured, and that, by proper treatment, the fatal event may sometimes be postponed for many years. The treatment recommended by preceding authors, appears to M. Bayle defective, as they did not distinguish the several

species, which, depending upon distinct causes, require different remedies.

"In fact, we cannot know with accuracy what the indications are in consumption of the lungs, until we have learned to distinguish its species; since, as we shall see by and by, each species is of a different nature, and presents particular indications. Besides, it is impossible to treat a patient properly, unless the indications which the nature of the disease presents be accurately fulfilled. When we mistake the species of phthisis, we mistake also the true indication, for this is subordinate to the nature of the phthisis; therefore we cannot treat the disease properly. If we do decide on a course of treatment, we act at random, and often lessen the chances of cure or of relief the patient might have had if left to the aid of nature. What I advance as to the difference of treatment which suits each species of phthisis cannot be disputed: for can one hope to cure or to relieve, by the same means, cancerous and scrofulous affections? and is it proper to treat in the same manner phthisis from calculi, and that which is the effect of an ulcer?

"One cannot then investigate with too much care what is the species, and what the real nature of the phthisis which we have to treat; since it is essential, in order to enable us to decide upon a suitable treatment; and yet it has been very little developed by authors, for which reason I shall undertake the subject here.

"In each of the six species of consumption which I have described, the affection of the lungs is of a peculiar nature, and belongs to an order of morbid alterations which does not develope itself exclusively in the organ of respiration. To be convinced of this, let us examine each of the diseases to which the different species of phthisis may be referred. These diseases are tubercles, cancer, melanosis, calculi, ulcers, and the developement of accidental cartilages.

"Tubercular affections and cancerous diseases discover themselves, as we know, not only in the lungs, but also in almost all other parts. Calculous concretions also form in different organs; and those which are found in the lungs of consumptive persons appear of the same nature as the calculi, and collections of calcareous matter, which are seen in the articulations of some

gouty persons. The melanosis is a peculiar degeneracy which affects the lungs, the liver, the mesentery, the intestines, and other organs. Ulcers may show themselves in all parts, and most of them are connected with a general disposition. Transparent miliary granulations hold a connection with the spontaneous developement of accidental cartilages; and these cartilages do not occur in the lungs alone, but also in the intestines, in the peritonæum, in the womb, in the heart, and in many other parts."

M. Bayle then proceeds to speak of the treatment of each species of phthisis, of their complications and symptoms, and of the selection and appreciation of the principal means to be employed. For these we must refer our readers to the work itself.

The number of phthisical patients in the Hotel Dieu, has enabled M. Bayle to give some curious tabular views, illustrative of the history of this formidable disease.

"The different kinds of phthisis are by no means all equally frequent. From the facts which I have collected, one might determine their relative frequency by the aid of the following table, extracted from an account taken of 900 dissections:—

Tubercular phthisis	624
Granular phthisis	183
Phthisis with melanosis . . .	72
Ulcerous phthisis	14
Calculous phthisis	4
Cancerous phthisis	3
	900

"In this table I have referred to the same species the particular cases in which this species was simple, and those where it was predominant."

The actual frequency of the disease is dreadful. M. Bayle calculates that one-fifth of the deaths in Paris is caused by phthisis, and that, besides, one-tenth of those who die of other diseases was phthisical.

The following table, shows the mortality of phthisis at different ages.

Age.	No. Dead.	Age.	No. Dead.
From 15 to 20 years	10	From 40 to 50 years	21
20 to 30 ——	23	50 to 60 ——	15
30 to 40 ——	28	60 to 70 ——	8——100

It appears that nearly the same number of phthisical patients die in every season of the year.

Number of consumptive persons who died in autumn, 64—winter, 58—spring, 54—summer, 68—Total, 244.

In regard to the duration of phthisis, the following table gives satisfactory information:

Months.	Deaths.	3 Months.	Deaths.	6 Months.	Deaths.	Years.	Deaths.
1	1						
2	6	1st	16				
3	9			1st	60		
4	12						
5	14	2d	44				
6	18					1st	124
7	18						
8	14	3d	44				
9	12			2d	64		
10	8						
11	7	4th	20				
12	5						
				3d	30	2d	48
				4th	20		
						3	6
						4	5
						5	3
						6	1
						7	3
						8	1
						9	3
						From the 9th round to the 40th	6
						Total	200

"Tubercular phthisis seems to be the species which, under all circumstances, is the soonest fatal, by carrying through all the stages those who, in truth, had the seeds of the disease, but never till then felt any symptom of it."

"Phthisis with melanosis appears to be that which commonly lasts the longest; but of those in whom the phthisis lasts a

great many years, some are affected with tubercular phthisis. There are then but few tubercles, and the ulcerations produced by the tubercles seem to form a purely local disease, which does not affect the vital functions."

The ninth and last chapter constitutes two-thirds of the whole bulk of the book. It contains a detail of the principal observations, 54 in number, from which M. Bayle has derived his opinions, and thus he enables others to judge how far they seem to be warranted; besides presenting us with very valuable materials for a history of this disease.

The work is concluded with a recapitulation of some points of doctrine which M. Bayle considers as established in his treatise.

"*1st*, When an accidental disease destroys a person affected with pulmonary phthisis in its commencement, or at its first degree, we always find the lesions of the lung I have mentioned; and no appearance of their tendency to get well. It is not from two or three insulated observations that I discovered this truth: it is from very extensive inquiry, and after numerous dissections of subjects in whom phthisis was at its first periods.

"*2d*, Chronic peripneumony, obstruction of the lungs, chronic pulmonary catarrh, which accompanies diseases of the heart, and other affections of the chest, sometimes resemble phthisis pulmonalis. But when individuals die of any of these disorders, or when any other accidental cause brings on their death, we do not find in the lungs any of the lesions which are remarked in the first degrees of pulmonary phthisis.

"*3d*, When phthisical persons have had partial inflammations of the parenchyme of the lungs surrounding the tubercles, or when they have experienced severe hæmoptysis which has endangered life, if they recover a better state of health, and after having been in marasmus, appear convalescent, they still retain a dry cough or some other symptom, which discloses the existence of phthisis, of which the progress is not interrupted, though the complication which made it more alarming has been cured. Some individuals arrived at this state of apparent convalescence sink under some other accidental disease, and the state of the lungs demonstrates then most evidently that the phthisis was not getting better. Tubercles in the lungs never terminate in resolution, any more than those which arise in other

parts: they remain stationary, or have a tendency to grow soft and to suppurate, as I have always stated, as well before the publication of my remarks on tubercular degeneracies as since that time.

" *4th*, Miliary granulations appear to be of a nature similar to that of cartilages; and when they have displayed themselves in the lungs, they produce there a state of irritation, permanent but impossible to be destroyed.

" *5th*, Cancerous phthisis, in its first degrees, is not less incurable than granular and tubercular phthisis, for scirrhous tumours never terminate by resolution, any more than tubercular affections.

" *6th*, I have shown that we commit great error, when we take for a scirrhus the chronic inflammation of a glandular part; but the error is as great, when we take a chronic inflammation of the chest for a pulmonary phthisis. In both cases we arrive at false conclusions, particularly when the disease terminates in recovery.

" But is it very certain, that the pulmonary phthisis is not a chronic inflammation? We have seen heretofore, that the tubercular degeneracy cannot be considered as a termination of inflammation: we have seen, that, after chronic inflammations which have lasted for a very long time, we did not find in general either tubercles or scirrhi in the lungs. In fine, I have made the remark, that, when tubercles are met with in an individual affected with chronic inflammation of the chest, they are sometimes in the lung of the opposite side to that which is the seat of the inflammation."

" *7th*, It results from what I have stated, that chronic inflammations and catarrhal affections may resemble phthisis, and that they may even contribute to its developement. Hence it follows, that physicians of the greatest talents deceive themselves sometimes in the diagnosis of these different diseases; and in consequence of this mistake, we see some individuals get well, whom one would have believed to be affected with an incurable disorder. These cures have given rise to two opinions diametrically opposite, which divide practitioners; some regarding pulmonary phthisis as curable at the second, or even at the third degree—others being convinced that it is incurable at every period."

ORIGINAL REVIEW.

Commentatio de Tracheitide Infantum, vulgo Croup vocata, cui præmium a quondam Imperatore Napoleone propositum ex dimidia parte delatum est. Auctore Johanne Abrahamo Albers, Medicinæ et Chirurgiæ Doctore, &c. &c. Lipsiæ sumptibus G. I. Goeschen, 1816. 4to. p. 228.

This elaborate performance was presented for the premium proposed in the year 1812, by the late Emperor Napoleon, for the best Dissertation written on the disease vulgarly termed Croup. The honours were shared between our author and the celebrated Jurin of Geneva. Great learning and extensive research are displayed throughout the work; references being made to no less than one hundred and forty different publications. In these quotations we observed with pride and satisfaction the frequent and honourable notice of the writers of this country.

Dr. Albers, after enumerating the several appellations given to the disease in question, prefers the title of tracheitis infantum, as more expressive of its real character. It will readily be conceded that the names assigned to diseases have been in many instances arbitrary and unphilosophical. Medicine in common with many other sciences is in a state of continual progression. Much relating to it is wholly conjectural, or but imperfectly known; and we believe that it has not yet arrived at that degree of perfection, which will warrant the expectation of any stability of language. Modern refinement, prematurely attempting to form a purer and more appropriate nomenclature, has unfortunately produced but too much confusion in the language of science; for each individual discovers some new circumstance or feature, omitted by his predecessors. So that after much time spent in acquiring a knowledge of the terms intended to designate any particular object, we find we

have a new vocabulary to learn. How much the purposes of science have been frustrated by such innovations it were needless to explain.

As a proper mark of respect we shall, however, in this analysis, adopt the term tracheitis infantum, as proposed by Dr. Albers.

Our author considers the disease as consisting in an inflammation of the mucous membrane, lining the larynx and aspera arteria, and bronchial tubes; generally accompanied by a copious secretion of the coagulable lymph, or fibrous part of the blood. This is the prevailing doctrine of the day, and is amply confirmed by the anatomical observations of Baillie, Cheyne, and others of the highest authority.

He describes the disease as varying in the mode of its attack, sometimes affecting the patient suddenly, at other times coming on in a more gradual and insidious manner. In many cases it puts on the symptoms of catarrh, and is often not distinguished from that disease for some days. In other cases it comes on with an immediate sense of suffocation. The voice becomes hoarse, the cough is of a peculiar sound, resembling the hoarse barking of a dog, or it is shrill, like the crowing of a cock. The hoarseness, the barking or stridulous cough, and the great difficulty in breathing, singly, or collectively, he considers as constituting the disease. He remarks, that he has known the hoarseness to continue for weeks. These symptoms, in his opinion, are dependent partly on the thickening of the membrane lining the larynx, and partly on the exudation of coagulable lymph, whereby the passage is constricted.

According to the experience of our author, those who have been once affected with the disease, are not exempt from future attacks, but on the contrary, they are often more disposed to repeated invasions. The disease is usually less formidable as the child approaches towards puberty. Hence the subsequent attacks are generally not so severe, though the reverse is sometimes the case.

The fever that accompanies the disease, is more commonly synocha, though in some instances, the typhoid character prevails.

The symptoms which come on, or are particularly aggravated about midnight, undergo some remission, or even total cessation in the morning, and early part of the day.

The disease, Dr. Albers considers as fraught with danger, though not necessarily mortal: an opinion, which appears to have been entertained by Chalmers. He acknowledges the difficulty of forming a correct prognosis, and remarks that some died suddenly, whom he did not apprehend to be in danger; and on the other hand, that some recovered whom he believed to be past all hopes.

He pronounces tracheitis to be most dangerous in children of a lax habit and prone to diseases of the mucous membranes. Hence our apprehensions are greater when the coagulable lymph is found in any great quantity. Nevertheless, many fat and robust children are violently affected from the beginning, and are in imminent danger from the mere derangement in the nervous system. Yet such cases are readily cured, when timely assistance is given, to the great credit of the art.

In answer to the question, whether any of the ancient writers or the authors, prior to the last century, have described the symptoms, which may be considered as pathognomonic of croup, he cites from the writings of Hippocrates, a passage which affords very satisfactory evidence, that the disease existed from the earliest ages, though it appears not to have been considered as a specific disease, but rather as a variety of angina. The popular name of croup, shows that it was familiarly known in North Britain, before it had engaged the attention of medical men, so far as to become the subject of particular description.

As the disease is acknowledged to be brought on by cold and moisture, our author does not hesitate in considering it as more prevalent in northern climates; and in corroboration of this opinion, he adduces the observations of physicians residing in different parts of Europe.

He states that croup is a disease, especially incident to children. He quotes cases of its having affected infants at the breast, and even at the early age of one month. In proof that those of riper years are not wholly exempt from its attacks, he adduces a long list of authorities, and refers to the memorable case of our ever to be lamented Washington.

The cause why children are more frequently affected with tracheitis he considers as twofold. In the first place they are more predisposed to inflammation of the mucous membranes; moreover tracheitis when connected with the exanthemata, is observed to be peculiar to persons of a tender age. But the cause on which he lays the greatest stress, is the state of the rima glottidis; for this aperture is observed to be more than proportionably small in persons under the age of puberty. The greater prevalence of tracheitis among boys, he refers partly to the form of the trachea and larynx, remarkable even at this period, and partly to the greater predisposition to inflammatory affections, and to a more frequent exposure to the causes exciting the disease.

Among the occasional causes he ranks the sudden vicissitudes from heat to cold, especially when combined with moisture. This is confirmed by the observations of the most intelligent writers. He mentions, however, that he has seen this disease during the month of August 1807. And in the month of May, of the ensuing year, when an unusually fervid season succeeded to an intense degree of cold, he was called to three cases. In the same month, the like number were visited by his friend Olbers, an eminent physician of Bremen, and well known to the public by his anatomical researches. He remarks that tracheitis is more prevalent between the autumnal and vernal equinoxes; and that in this period, the months of November and December, noted for the long continued fogs, are pre-eminent for the frequent occurrence of the disease. Persons inhabiting the borders of rivers, and the neighbourhood of marshes, situations naturally abounding in moisture, are particularly liable to be affected with croup.

Under the head of occasional causes, he notices the defect of covering, whereby the body is not sufficiently defended against the vicissitudes of the weather. He suspects that the disease is often produced in Scotland, by the children going bare-footed, and with their necks exposed, during the depth of winter. He also thinks that the close cutting of the hair, renders children more liable to the disease. In support of this opinion, he adduces the authority of Sœmmering, and quotes the writings of Wolf of Altona, who remarked that the Jews inhabiting that city were less afflicted with croup, and who

ascribed this exemption, to the custom among that nation of keeping the head covered.

He pronounces tracheitis not to be contagious. When the disease affects several members of a family, he considers it as owing to a peculiar idiosyncrasy in such persons, or to their being exposed to the same exciting causes.

To the question whether tracheitis is ever consequent on other diseases, and especially the exanthemata; he answers in the affirmative. This assertion is founded on his own experience, and is largely confirmed by the observations of Morton, Starr, Johnston, Withering, Clark, Ueberlacher, Heberden and Rush.

Dr. Albers performed a number of experiments, with the view of ascertaining whether the disease could be excited artificially in the lower order of animals. After making an opening into the trachea, below the cricoid cartilage, he injected into that tube various stimulating fluids, as a solution of the oxy-muriate of mercury. By these means violent inflammation, and the exudation of coagulable lymph were produced, but still many of the symptoms of tracheitis were wanting.

We now proceed to notice the practice adopted by our author in the treatment of the disease. When tracheitis is of the sthenic character or accompanied by the synocha form of fever, his principal reliance is placed in emetics. But he appears not to have employed such large doses as are frequently directed. The tartrite of antimony and the ipecacuanha root were the articles which he generally prescribed, sometimes separately, but often in conjunction. He extols, moreover, the efficacy of emetics in relieving spasm, on which the disease occasionally depends. If the disease should be very violent, the fever and determination to the head very great, he recommends the immediate abstraction of blood. It was however a matter of surprize, on perusing the book, to learn that our author depended solely on topical bleeding, by means of leeches, and that he never directed blood to be drawn from a vein. The leeches he directs to be applied to the front of the neck, in the neighbourhood of the larynx. When these remedies fail to remove the disease, he orders the application of a blistering plaster so as to cover the larynx and trachea, down to the sternum.

Of the powers of mercury, in curing the disease, Dr. Albers is not so warm an advocate as many who have written on the cure of croup. To prevent the vomiting, so frequently excited by the preparations of this mineral, he was in the habit of combining small doses of magnesia. He considers the combination of camphor and mercury, as particularly adapted to allay inflammation. The camphor he states, as possessing the further advantage of restraining the diarrhœa, which so often follows the use of mercury, and in producing a determination to the skin. It is with this latter view, of determining to the surface, that he so highly extols the combination of camphor and the red sulphur of antimony. His mode of prescribing these is as follows:

Take of the Syrup of marshmallows one ounce,
Mucilage of gum arabic half an ounce,
Camphor four grains,
Red sulphur of antimony three grains, and form a linctus, of which give the patient two teaspoonfuls every two hours. This is suited for a child of three years.

If it is deemed adviseable to administer mercury, while the patient is taking the above remedy, he prefers giving it at the intermediate hours.

In the use of the polygala senega, so warmly recommended by Archer, he prefers the infusion to the decoction, as retaining the volatile parts in greater perfection. Where the disease has brought on great debility, accompanied by spasmodic respiration, our author expresses himself in high commendation of musk.

In the asthenic form of tracheitis, especially if the children are of a scrofulous habit or worn down by previous disease, emetics are peculiarly adapted to afford relief, and often induce an immediate solution of the disease. After the operation of the emetic, he recommends a combination of camphor and the red sulphur of antimony with alternate doses of mercury, guarding against too frequent evacuations from the bowels. Here the polygala senega, he considers as possessing peculiar efficacy; and blisters, he states, ought not to be omitted. If the disease should increase, we must resort to musk and those articles which stimulate the surface.

In cases of tracheitis, coming on after malignant small pox, he recommends that the disease should be combated by the exhibition of mercury. But as in this form of small pox, the bowels are so liable to be affected with diarrhœa, it becomes necessary to conjoin opium. Our author however, appears to be opposed to the exciting of salivation.

In the measles, which are often ushered in by tracheitis, an emetic is to be prescribed in the first instance. If the inflammatory action should be great, he directs bleeding by means of leeches and the application of a blister to the throat. Internally, he advises the exhibition of the acetite of ammonia, with elder-flower water and simple oxymel. When the sthenic diathesis is subdued, he employs camphor and the red sulphur of antimony. If tracheitis comes on after the eruption of measles, we must first ascertain whether there exists any inflammation of the lungs, for this would forbid the use of emetics. If the fever is typhus, we must resort to camphor, musk, and the red sulphur of antimony. When tracheitis comes on after the measles have been cured, it is to be treated according to its peculiar character.

When tracheitis is combined with scarlatina, if the phlogistic diathesis prevail, the disease is to be treated accordingly; but should it appear in conjunction with the malignant or typhous form, the only remedies are mercury, musk, camphor and blisters.

We shall now close this analysis in which we have endeavoured to give, in a condensed form, whatever we could discover in the work which was likely to advance a knowledge of the disease. We have offered a succinct, yet tolerably complete view of the practice adopted by our author. The impression left on our mind by a careful examination of the means proposed by him for combating the disease, is, that his practice was feeble, and not adapted to the violent forms of croup, such as we frequently meet with in this hemisphere. Perhaps we should pass a correct judgment on the work, if we stated that though highly ingenious and instructive, it appears to be rather the result of great reading and literary research, than of actual observation, drawn from the bedside of the sick.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

VACCINATION.

The ordinance of the city councils, for promoting Vaccination in the city, has been carried into effect, by the appointment of Physicians, the report of whose operations has not yet been published.

By the report made at the annual meeting of the Vaccine Society, on the first day of January 1817, it appeared, that their Physicians had successfully vaccinated nineteen hundred persons, in the City, Northern Liberties and the district of Southwark, during the last year; making the whole number successfully vaccinated by the Physicians of the society, since its formation in 1809, ten thousand six hundred and thirty-three.

DISPENSARIES.

Statements of the proceedings of the three Dispensaries have been published, by which it appears, that,

They have had under their care the following number of patients.

Philadelphia Dispensary.

From December 1, 1815, to December 1, 1816. 3022

Cured, - - -	2662	
Dead, - - - - -	87	
Relieved, - - -	98	
Irregular, - - -	14	
Removed, - - -	24	
Remaining under care, -	137	—3022

Northern Dispensary.

From October 1st, to December 30th, 1816. 303

Cured, - - -	141	
Dead, - - - - -	16	
Relieved, - - -	3	
Removed, - - - -	2	
Irregular, - - -	11	
Remaining under care, -	130	—303

Southern Dispensary.

From August 26th, to December 31st, 1816, - 520

Cured, - - - - -	409
Dead, - - - - -	15
Relieved, - - - - -	36
Removed, - - - -	3
Irregular, - - - -	4
Remaining under care, -	53—520

The Trustees of the University of Pennsylvania, on the elected the following Professors.

Dr. Robert M. Patterson, Professor of Natural Philosophy.

Dr. William P. C. Barton, Professor of Botany.

Dr. Charles Caldwell, Professor of Natural History, including Geology and Zoology.

Dr. Thomas Cooper, Professor of Mineralogy and Chemistry, as applied to Agriculture and the Arts.

Dr. Thomas T. Hewson, Professor of Comparative Anatomy.

American Philosophical Society.

At an Election of Officers of the American Philosophical Society, held at their Hall in Philadelphia, after due notice given, on the 3d day of January 1817, the following officers were chosen:

President—Caspar Wistar.

Vice-Presidents—R. Patterson, William Tilghman, P. S. Du Ponceau.

Secretaries—T. C. James, R. M. Patterson, J. S. Dorsey, W. P. C. Barton.

Counsellors for three years—Thomas Cooper, James Gibson, N. Chapman, S. Colhoun.

For one year—William Hembel, Jr.

Curators—Z. Collins, J. Cloud, T. T. Hewson.

Treasurer—John Vaughan.

METEOROLOGICAL OBSERVATIONS.

State of the weather at Philadelphia during the last six months of 1816.

July.

Thermometer—Lowest, at 9 A. M. 66. 1st day of the month.
Highest, at 3 P. M. 78. 25th and 27th.
Mean, ... 70.

Little rain this month.

August.

Thermometer—Lowest, at 9 A. M. 64. 28th and 29th of the month.
Highest, at 3 P. M. 87. 17th.
Mean, ... 70.

A cool summer, such as is seldom experienced—very little thunder and lightning. The crops of wheat and rye, very fine as to quality, but in many places small as to quantity—oats abundant—vegetables excellent; and fruit very good and plentiful—grass crops short. Earthquakes in Great Britain and some of the Eastern States.

September.

Thermometer—Lowest, at 9 A. M. 56. 28th day of the month.
Highest, at 3 P. M. 83. 3d.
Mean, ... 62.

Weather cool—Indian corn and buckwheat suffered much by cold weather—all the grain crops abundant in Ohio, Kentucky and Tennessee. The summer and autumn very healthy.

October.

Thermometer—Lowest, at 9 A. M. 52. 19th and 28th days of the month.
Highest, at 3 P. M. 67. 3d, 21st and 22d.
Mean, ... 54.

Northerly and westerly winds, have been more prevalent than usual this season—the latter part of the season, south westerly winds were common.

NOVEMBER.

Thermometer—Lowest, at 9 A. M. 34. 26th day of the month.
Highest, at 3 P. M. 74. 4th.
Mean, ... 50.

Weather mild for the season.

DECEMBER.

Thermometer—Lowest, at 9 A. M. 27. 3d day of the month.
Highest, at 3 P. M. 64. 27th.
Mean, ... 35.

This month unusually mild—no fall of snow here. An healthy season. Small-pox continues amongst us, but has not spread much. The measles have not entirely disappeared. The disease, generally called *yellow fever* has been very prevalent and mortal in several of the West India Islands, particularly Guadaloupe and Martinique. From every part of the United States we hear of an unusual degree of health. In Europe the weather has been inclement—great rains—and failure of crops.

Lobstein's recent Remarks and Observations upon the Healing Power of Phosphorus. Communicated by Dr. VON EMBDEN, at Hamburgh.

[From the London Medical and Physical Journal, for Oct. 1816.]

Professor LOBSTEIN, at Strasburgh, in his monography on phosphorus, in addition to the copious historical notices respecting its invention, its physical and chemical nature, and the use hitherto made of it in cases of sickness, has also published the results of his own experience; of the latter, we shall offer a very short account. Phosphorus is like other bold remedies: an improper use, or a disproportionate dose, produces dangerous consequences; it is, therefore, of great importance for the practical physician before he makes use of it, to be exactly informed of the manner of its application, and the dose to be administered.

Mr. L. objects to all the present pharmaceutical forms of phosphorus, except its solution in sulphuric æther. Only in this

form, its caustic property is changed into a reviving and analeptic substance. According to Lœbenstein Lœbel's proposal, he adds a small quantity of a distilled aromatic oil, whereby not only the efficacy of the remedy is improved, but it is also more easily preserved; the solution of phosphorus is thus complete. To prevent its decomposition, it is proper to give it in a little syrup, or on a lump of sugar.

With regard to the dose, he has been taught by experience that in most cases one grain of phosphorus in twenty-four hours is quite sufficient, and that we ought neither to be too timid nor too bold in its administration; however, it will be always useful to begin with a small dose, and to increase or lessen the same, according to the symptoms. As soon as the patient feels any inconvenience, perceives any heat in the stomach, or vomits, it must be set aside.

Respecting the rules of precaution necessary in its application, M. Lœbenstein Lœbel's remarks are fully confirmed. The phosphorus agrees better, and can be borne in a larger dose, when the air is dry and clear than in cold and rainy weather. It ought never to be taken on an empty stomach, but always an hour after the patient has taken some nourishment; salad and acid food, and drink in general, even beer, is improper. To quench the thirst, a mucous solution of salep, with sweet and generous wine, is the best beverage; the patient must also refrain from drinking immediately after having taken the phosphorus.

In acute diseases, when there is commonly but little appetite, broth with a little nutmeg, or vermicelli, sago, &c. may be taken; but, in chronic disorders, where digestion is not impaired, veal, beef, and mutton, either boiled or roasted, fowls, snipes, hares, as also light vegetables, such as carrots, French beans, &c. are a fit diet. Cabbage, turnips, onions, radishes, rape, cole, pease, &c. must be avoided, causing a sensation of fulness in the region of the stomach, together with anxiety, insupportable heat, and often vomiting and diarrhœa. The food must neither be taken too hot nor too cold, fruit and milk are prohibited.

In case the patient can go out, it is of the greatest importance to be on his guard against catching cold, which is apt to

occasion vertigo, and diarrhœa, or a relapse. Convalescents should wear a flannel shirt next to the skin; warm baths agree also very well with persons taking phosphorus, particularly in disorders of the nervous system, but they must stay above a quarter of an hour in it.

Effects of the Phosphorus upon the Animal Organism.—In acute diseases, such as typhus, the effects of phosphorus appear frequently after four hours, but sometimes not till twenty-four. The vital warmth returns, transpiration is restored, the pulse improves, the urine is voided freely and commonly turbid, with a sediment; the abdomen loses its tension, the excrements have a sulphureous smell and shine in the dark; the delirium ceases, and the patient recovers his recollection, the mental faculties return, and a beneficial sleep restores the strength in a few days, the tongue grows clean and the appetite improves, and the countenance becomes chearful. These appearances, however, do not take place so soon in persons advanced in years, they vary according to the nature of the disorder, and do not show themselves so distinctly in chronic cases.

Phosphorus is a remedy the effect of which extends over all the systems of the animal economy, by rousing their activity, but it particularly operates upon the nervous system; the effect is very speedy and powerful, but of short duration. It is one of the most penetrating volatile excitants, and very particularly adapted for reviving the vital activity when nearly exhausted.

But this beneficial effect is only produced when the remedy is completely dissolved in its vehicle; when given in substance it operates as a violent caustic, equal to actual poison, by exciting most violent pains, burning, convulsion, tremor, annihilation of the powers, and death. At other times, if its use is too long continued, it causes the most obstinate complaints in the stomach; and, in case of a scirrhosity of the stomach, occasions death, as has been discovered afterwards on dissection.

Mr. L.'s own observations, communicated upon the efficacy of phosphorus in various disorders, are all of that kind where the complaint has resisted other powerful remedies, or had been of long standing.

In three cases, where typhous persons were in the last stage

of exhaustion, and where other irritative remedies seemed quite ineffectual, the vital activity was again roused in an astonishing manner by a few doses. The saving of a peripneumonic patient in the last stage of debility, performed by it, was equally unexpected. A tertian fever, obstinately resisting a variety of remedies, such as bark with flor. sal. ammon. mart., opium with cinnamon, and even arsenic, was considerably lessened in the next attacks, and disappeared after phosphorus had been administered for eight days, during the intervals. A periodical cephalalgia in a very irritable woman, an obstinate cardialgia, and a chronic gouty complaint, wandering about in the body, was cured by it; menstruation, suppressed by catching cold, was restored, and the chlorotic patient recovered by the use of this remedy, combined with the tincture of cinnamon. It is superfluous to mention, that phosphorus, in the hands of a prudent physician, is a very powerful remedy, where the object is vigorously to rouse the vital activity, and to operate in a decisive manner; and Mr. L., by communicating these observations, in confirmation of the healing powers of this important remedy, has acquired a decisive merit.

New Pharmacopœia of France.

We rejoice to learn that the Faculty of Paris are at length sensible of the reproach which they have so long merited, for the want of a National Pharmacopœia:—a defect, which we took occasion in the fourth volume of the *Repository*, p. 382, to descant upon with some degree of severity.

Lond. Med. Rep.

Experiments made with a view to ascertain the Principle on which the Action of the Heart depends, and the Relation which subsists between that Organ and the Nervous System. By A. P. Wilson Philip, Physician in Worcester.

[From the Eclectic Review, for October, 1816. Vid. Philosophical Transactions for 1815.]

This paper contains an account of twenty-three experiments, and as the conclusions to which they lead are chiefly important, we shall transcribe the inferences which Dr. W. P. has himself deduced from them.

1. That the muscles of involuntary motion obey the same laws with those of voluntary motion.

2. That the apparent difference in the nature of these muscles, arises from their being under the influence of different stimuli.

3. That they are both capable of being stimulated through the nervous system.

4. That the power of both is independent of the nervous system.

5. That what is called the nervous system, consists of two parts, whose existence is not immediately dependent on each other; the one performing the sensorial functions, the other conveying impressions to and from the sensorium, and, without bestowing any power on the muscular system, acting as a stimulus to it.

6. That there is therefore in the most perfect animals, a combination of three distinct vital powers, not immediately depending on each other; one of the muscular system, one of the nervous system properly so called, and one of the sensorial system.

7. That the muscular system, though independent of the nervous system, is so influenced by it, that the power of the former may even be destroyed through the nervous system.

8. That both the muscular and nervous systems, though independent of the sensorial system, are so influenced by it, that they may even be destroyed through it.

9. That although in the less perfect animals, we find the muscular life existing alone, and the muscular and nervous existing without the sensorial life; in the more perfect animals they are so connected, that none can exist long without the others.

10. That nutrition, circulation, and respiration, are the means by which they are so connected.

Some Experiments and Observations on the Colours used in Painting, by the Ancients. By Sir HUMPHREY DAVY, LL.D. F.R.S.

THE different colours examined by this eminent chemist, have been found in making excavations in the Roman territory; or in the ruins of ancient magnificence with which it abounds. He obtained permission also to examine the colours of a celebrated antique painting, the Nozze Aldobrandine. Of three reds found in the baths of Titus, one was minium or red oxide of lead, the other two ochres of different tints; another red found on the walls of the bath proved on examination to be vermilion. The reds of the Aldobrandine painting proved to be all ochres. The yellows, of which three different varieties were submitted to examination, were mixtures of yellow ochres with different proportions of chalk, and one was a mixture of yellow ochre with red oxide of lead. The yellows in the painting were all ochres. The blues were of different shades from the mixture of different proportions of chalk, but they all owed their colour to the same substance, a fine blue powder, similar to the best smalt or ultra-marine, rough to the touch, which did not lose its colour by being heated to redness, but was semifused and agglutinated at a white heat. On applying the usual means of analysis, it was found to be a blue frit containing soda, and coloured by oxide of copper. It appears, too, that they were acquainted with a species of indigo. Different antique specimens of fine transparent blue glass, Sir H. ascertained to be coloured with oxide of cobalt. Other specimens of pastes and glass were coloured by oxide of copper, but the colour of these had a tint of green, and their transparency was much less perfect. The different greens examined proved to be mixtures and combinations of oxide of copper. The green glasses of the ancients were found also to be coloured by the oxide of copper. The purple, was found to be a lake mixed with carbonate of lime; but whether of animal or vegetable origin it was found impossible to determine. The blacks had all the characters of pure carbonaceous matter; and of the browns, several proved to be ochres, and one contained oxide of manganese, as well as oxide of iron. The whites presented

the characters of carbonate of lime, and fine aluminous clay. Sir H. endeavoured to ascertain by what means the colouring matter had been fixed on several pieces of stucco, and on the Aldobrandine painting; but he could not detect the presence of any wax varnish, or any animal or vegetable gluten. Of these different colours, the azure, the red and yellow ochres, and the blacks, have preserved their colours perfectly in the ancient fresco paintings, not having undergone the smallest apparent change, but the others have all suffered more or less.

Eclectic Review.

Experiments to ascertain the Influence of the Spinal Marrow on the Action of the Heart in Fishes. By Mr. William Clift.

In this communication, Mr. Clift has given a very minute detail of the phenomena which he observed in four experiments made upon the carp, a fish which appears to be more tenacious of life than most others. The object which he had principally in view was to determine the influence of the spinal marrow upon the muscular system. The results which he obtained we shall transcribe.

1. The muscles of the body of a carp, four hours after the brain and heart are removed, can be thrown into powerful action.

2. The moment the spinal marrow is destroyed, these muscles lose all power of action.

3. When water is admitted into the pericardium, and the fish allowed to swim about, the action of the heart ceases sooner than when that organ is exposed to the air, and the fish kept quiet.

4. Whether the heart is exposed or not, its action continues long after the spinal marrow and brain are destroyed, and still longer when the brain is removed without injury to its substance.

5. The action of the heart is accelerated for a few beats, by exposure of that organ; by exposure of the brain; injury to the brain; destruction of the spinal marrow while connected with the brain; by the connexion between the brain and spinal

marrow being cut off: while removing the whole brain produces no sensible effect upon the heart's action, and destroying the spinal marrow after it is separated from the brain, renders the action of the heart slower for a few beats.

Eclectic Review.

On the Nature and Combinations of a newly discovered vegetuble Acid; with Observations on the Malic Acid, and Suggestions on the State in which Acids may have previously existed in Vegetation. By M. DONOVAN, Esq.

THIS acid, to which Mr. Donovan has given the name of Sorbic acid, is obtained in rather large proportions from the ripe fruit of the Sorbus Aucuparia, though it is not confined exclusively to that fruit. When perfectly pure, it is transparent, fluid, and inodorous, soluble in alcohol, and in any proportion in water. When evaporated, it becomes an uncrystallizable solid mass, but deliquescent. If subjected to distillation, no part of the acid passes over in the process. Its acidity is such as to cause a painful sensation upon the tongue. It is little changed by being kept in an uncombined state. In those fruits in which it exists mixed with malic acid, it is the first to disappear, while the malic acid retains its distinctive properties long after the commencement of decay in the plant. The saline combinations which this acid forms, sufficiently distinguish it from the other vegetable acids, and especially from the malic with which it is generally found co-existent. With lead it forms three saline combinations, a super, a neutral, and a subsalt. The super-sorbate does not assume the solid form, but the neutral and subsorbate require more than 5000 times their weight of water for their solution. With potash, soda, and ammonia, when the acid is in excess, it forms permanent crystals, which are soluble in water, but insoluble in alcohol. The malic acid forms with these bases, salts which are deliquescent and uncrystallizable. With the earthy carbonates, the sorbic acid forms neutral salts which are precipitated as soon as they are formed. With alumina it does not appear to have any action, and hence Mr. D. thinks it may probably prove a valuable agent in the hands of the analytic chemist, to obtain this

earth perfectly pure. Mr. D. observes that this acid is never found in any mature fruits, which contain any other acid than the malic; that the malic acid is never found alone in any mature fruit, but always accompanied with the sorbic, and that these two acids when co-existent exclude every other. The fruits which contain these acids together, are apples, plums, the berries of the sorbus, barberries, and sloes; of these the sorbus berry contains the largest quantity of sorbic acid, unripe apples less, ripe apples and sloes still less, barberries very little, and plums least of all. As the discovery of the general co-existence of this acid with the malic renders Scheele's process for procuring malic acid liable to considerable objection, M. D. recommends the general adoption of Vauquelin's process for obtaining it from the juice of the Sempervivum Tectorum, in which this acid exists alone, in a state of combination with lime; but as there is some difficulty in completely decomposing the malate of lead by sulphuric acid, he suggests the employment of sulphuretted hydrogen, to remove the last portions of lead, by which means the malic acid is obtained perfectly pure. M. D. thinks it probable that the vegetable acids are not formed primarily by the immediate combination of their elements, but by the combination of oxygen with the bitter principle, and the facts which he has adduced give considerable probability to this view of their origin.

Eclectic Review.

A Quarterly List of Foreign Publications, from July, 1816, *to the end of September*, 1816.

[From the Journal of Science and the Arts, No. III.]

NATURAL HISTORY.

Histoire naturelle des Animaux sans vertèbres, par Mons. Le Claval Delamarck. 3 vol. 8vo. Paris.

A. Risso, Histoire naturelle des Crustacés des Environs de Nice, 1 vol. 8vo. plates.

Essai sur l'Histoire de la Nature, par MM. Gavotz et Toulouzan, 3 vol. 8vo. pp. 1800.

Herold, *Entwiklungs-Geschichte, &c.* Histoire anatomique et physiologique du developpement des Papillons, 1 vol. 4to. plates.

Mémoires de la Société Imperiale des Naturalistes de Moscow, 2 vol. 4to. 24 plates.

Gaëde, Beitraege, &c. or Memoir on the anatomy and physiology of the Medusæ. Berlin, 8vo. plates.

Hoppe, Enumeratio Insectarum elytratorum circa Erlangam indigenarum. Erlang. vol. 8vo. plates.

Modeer, Bibliotheca Helminthologica, 8vo. Erlang.

BOTANY.

Neonographia de Potentilla, Auctore Nestler, M. D. Strasbourg, 1 vol. 8vo.

Flore du Dictionnaire des Sciences Medicales, 25 livraison.

Gallesio, Théorie de la Réproduction vegetable. Vienna, 1 vol. 8vo.

Plato, Giftpflanzen, &c. On the poisonous Plants of Germany. Leipsic, 1 vol. 8vo.

Gainepel, Abbildung der Teutschen Holtzarten. Or Description of the indigenous Trees of Germany. 19th and 20th Numbers, plates. Berlin.

CHEMISTRY.

Davy, Elementi di Chimica Agraria, tradotti in Italiana da Targioni Tozzetti. 2 vol. 8vo.

Gilbert, Annalen der Physik, &c. Number for January and February.

Schweigger, Neues Journal der Chemie, &c. same Number.

Starke, Beschreibung. Description of meterological Instruments and their use. vol. 4to plates, Nuremberg.

Sangiorgio, Dissertazione sul Vetro idrostatico impiegato a conoscere la gravità specifica de' Corpi. Milan, 1 vol. 8vo.

Bibliothèque universelle des Sciences et des Arts. Geneva, January, February, March, April, May.

Giornale di Scienze e d'Arti. Florence.

Biblioteca Italiana di Scienze e d'Arti. Milan, 3 Numbers.

Giornale Enciclopedico di Napoli. Numbers for March and April.

Giornale di Fisica di Brugnatelli. Second *bimestre*. Pavia.

Dagoumen, Essai sur le Gaz azote atmosphérique. 8vo. Paris.

Mineralogy and Geology.

Parrot, Grundriss der Physick der Erde, &c. Elements of Geology. 1 vol. 8vo. plates, Riga.

Freierleben, Geognostische Arbeiten, or Geognostic Memoirs, in 3 vol. 8vo. plates, and a map.

Pohl, Ueberblik, &c. or, a systematic Table of simple Fossils, vol. 4to. Prague.

Hoffman, Handbuch der Mineralogie, &c: Elements of Mineralogy, the 2d vol. Freiberg.

Vesi, Storia fisica della Terra, &c. Milan, 8vo.

Medicine, Surgery, Anatomy, and Physiology.

Porinelle, des Etudes du Medecin, de leurs connexions, et de leur methodologie, Pamp. 4to.

Nauche, Maladies de l'Uterus, ou de la Matrice, 1 vol. 8vo.

I. S. Ch. Nosographiæ compendium e novissima Nosographiæ philosophicæ editione excerptum, 8vo. 1 vol. pp. 500.

Conveilhier, Essai sur l'Anatomie pathologique en général, et sur les transformations et productions organiques en particulièr, 2 vol. 8vo. Paris.

Eveillé, Mémoire sur l'état actuel de l'Enseignement de la Medecine, et de la Chirurgie en France, 1 vol. 4to.

Medizinische Annalen, Annals of Medicine and Surgery. Numb. for Jan. Feb. March, 1816.

Sprengel, Institutiones Pharmacologiæ, Leipsic, 1 vol. 8vo.

Harles, Opera minora academica medica, &c. Leipsic, 1 vol. 8vo.

Reil, Elements of general Pathology, Halle, 2 vol. 8vo.

Bernhardi, *Handbuch*, &c. Traité de la Contagion gen. tom. 1.

Stein, Neue Annalen, or, New Annals of Midwifery.

Hecker, Handbuch, or complete Manual of Military Surgery and Medicine, 1 vol. 8vo. Gotha.

Hufeland, Journal der praktischen Heilkunde, or Journal of practical Medicine, Numb. of March.

Recueil général de Medecine, Paris, 8vo. June and July.

Journal Universel des Sciences medicales, May.

Annales chimiques de Montpellier, May and June.

Grimaldi, Elementi di Anatomia, 11 vol. 8vo.

Panvini, Rimedj preservativi della Peste, Naples, 8vo.

Billard, Dissertations françaises et latines sur les points les plus importans de l'art de guerir, Paris, 8vo. 2 parts.

Freteau, Traité élémentaire sur l'Emploi legitime et méthodique des émissions sanguines dans l'art de guerir, 1 vol. 8vo.

Giraudy, Traité de Therapeutique générale, 8vo. Paris.

Remer, Police Judiciaire pharmaco-chimique, translated into French from the German.

Gardanne, Avis aux Femmes qui entrent dans l'âge critique, 1 vol. 8vo. Paris.

Denis, Recherches chimiques et medicales sur l'uroscopie, 8vo. Paris.

Achard-Lavost, Principes de Thérapeutique appliquée aux Maladies internes, 8vo. Paris.

Mémoires sur les Maladies croniques, les évacuations sanguines, et l'acupuncture, 8vo. Paris.

THE

ECLECTIC REPERTORY

AND

ANALYTICAL REVIEW.

VOL. VII. APRIL, 1817. No. II.

SELECTED PAPERS.

Account of some Experiments made with Newman's Blowpipe, *by inflaming a highly condensed Mixture of the gaseous Constituents of* WATER; *in a Letter to the Editor, from* EDWARD DANIEL CLARKE, LL.D. Professor of Mineralogy in the University of Cambridge.

[From the Journal of Science and the Arts, No. III.]

To the Editor.

SIR,

IF the chemists of former ages had been told that to increase the action of *fire* it is necessary that the combustible be *water*, some such author as *Agricola*, or *Bernard Cæsius*, in his chapter "*de Aquarum miraculis*," would perhaps have maintained that this truth was mystically typified in the rape of *Proserpine*, by *Pluto*, from the fountain of *Cyane*. This wonderful property in the constituents of *water* is however now so well known, that it may serve to illustrate some remarkable phænomena of fusion in volcanoes, whose apertures, ejecting torrents of liquid rocks, are, in fact, so many *blowpipes* upon a large scale; whence mixed *gases*, which have resulted from the decomposition of *sea-water*, and which have undergone the utmost *compression*, make their escape in a state of *ignition*.

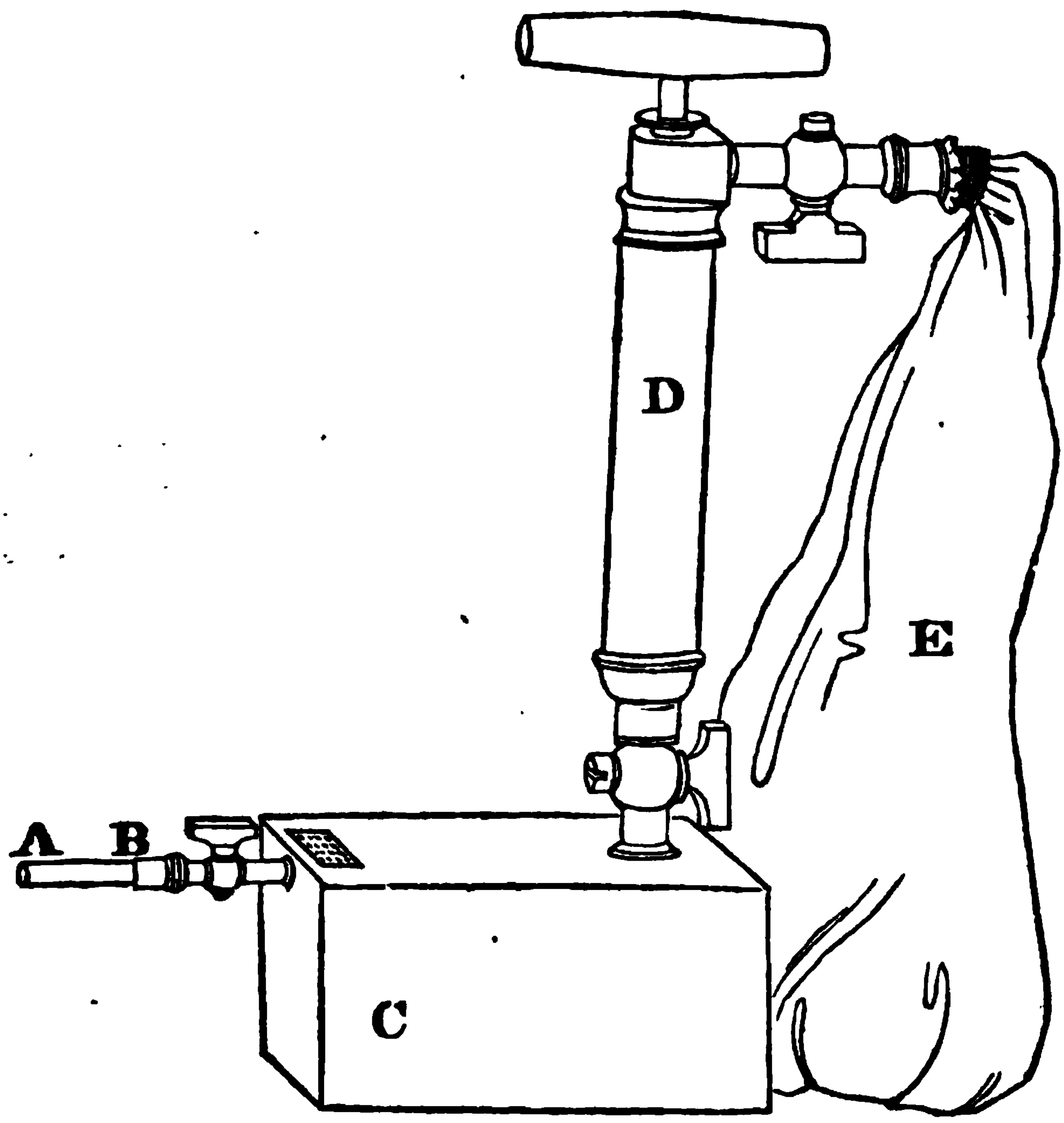
Of the power of heat produced by burning together *hy-*

drogen and *oxygen gases*, every one has been aware who has attended to the experiments for the composition of *water*.* Having occasion to allude to the temperature thereby excited, during the last Course of my Public Lectures in this University, and with reference to observations that I had myself made upon Mount *Vesuvius*, I used an apparatus adapted to the blow-pipe made by Mr. *John Newman*, the construction of which was explained by Mr. *Newman* himself, in a communication to the first Number of your Journal.† Upon this occasion the flame of a common *spirit* lamp was propelled by a stream of condensed *oxygen* from the reservoir of the *apparatus:* but the *hydrogen* from the *alcohol* not being afforded in the proper proportion for producing the greatest heat, I consulted Mr. *Newman* upon the subject, who recommended that a condensed mixture of the two *gases* should be ignited instead of the *spirit* lamp. The danger of such an experiment with an explosive mixture, was obvious: several eminent chemists considered it as extremely hazardous; but it was suggested by Mr. *Newman*, that upon the principle of *Sir H. Davy's* wire-gauze safe-lamp, there would be no danger if the mixed gases, previously to their ignition, were made to pass through a capillary tube. Upon this I applied to *Sir H. Davy*, and requested to have his opinion. He replied, that he had tried the experiment, and that he was convinced "there would be no danger in burning the compressed gases by suffering them to pass through a fine thermometer tube, $\frac{1}{80}$ of an inch diameter and three inches in length." In consequence of this encouragement I obtained from Mr. *Newman* the necessary

* The first application of these *gases* to aid the operations of the *blow-pipe* was made in 1802, by an American, *Robert Hare*, jun. Professor of Natural Philosophy in the University of Philadelphia. (*See Bruce's American Mineralogical Journal, Vol. I. No. 2. p. 97, Note.*) An account of Mr. *Hare's* experiments also appeared in the *Annales de Chimie*, No. 134, entitled *Mémoire sur l'usage du Chalumeau, et les Moyens de l'alimenter d'Air, &c.* The first usage of the gases in a state of mixture from a common reservoir was made by an unknown native of Germany.

† See Journal of Science and the Arts, No. I. Art. VII. p. 65. Also *Thompson's Annals* for May 1816, p. 367. It was first exhibited in *Cambridge* by the Rev. Mr. *Powell*, of Trinity College, during a Course of Lectures upon the Chemistry of Agriculture.

apparatus* and began a course of experiments, which have already been attended with some curious results. These ex-



periments were made in the presence of the Rev. Mr. *Cumming*, our Professor of Chemistry, who kindly supplied me with whatever chemical apparatus was required; the Rev. *J. Holmes*, well known for his analytical researches; Dr. *Ingle*, and other members of this University. As these gentlemen were not always all of them with me at once, nor the experiments all made at the same time, I shall, in stating them, attend only to the order in which they occurred, without men-

* See the annexed wood-cut.

A. B. is the *glass-tube*.

C. The *Reservoir* for the condensed *gas*.

D. The *Piston* for condensation.

E. The *Bladder* holding the gaseous mixture previously to its condensation.

tioning the precise day when they were exhibited, or the names of the persons who were present.

Having exhausted the reservoir of the *blow-pipe* C, of atmospheric air, a *gaseous* mixture was introduced, and as highly condensed as possible, by means of the piston D, consisting of two parts by bulk, of *hydrogen*, and one part of *oxygen*:* which in all the following experiments I have found to afford, when ignited, the greatest degree of heat. A portion of this mixture being allowed to pass through the orifice of the *blow-pipe*, was ignited at the extremity of the glass tube A. B.; and such was its exalted temperature, that, as the sequel will prove, it has banished altogether the character of *infusibility* from the list of chemical tests to which minerals may be exposed. I cannot believe that this temperature has yet been exceeded by that of any apparatus hitherto employed. *Platinum* was not only fused the instant it was brought into contact with the flame of the ignited *gas*, but the melted metal ran down in drops. Some of these drops, which fell from a wire of *platinum* $\frac{1}{10}$ of an inch in diameter, weighed five grains. But the rapid fusion of *platinum* was not the only remarkable circumstance attending this experiment; it was accompanied by the combustion of the metal itself; which caught fire and continued to burn like *iron* wire in *oxygen gas*, with a vivid and beautiful scintillation. Afterwards we found that we were thus deprived of a valuable means of supporting less fusible substances, when we wished to expose them to the action of the flame; a small but stout crucible of *platinum* being incapable of sustaining the heat without becoming ignited, and fusing, as in the former instance.

Our next experiments were made with *palladium*. This metal became fused with greater rapidity than the *platinum*. It melted before the flame like *lead;* and beginning to burn,

* The intensity of the heat depends upon the purity, as well as exact proportion of the two *gases*. The *oxygen* obtained from *manganese*, does not cause any thing like the heat which is occasioned by mixing with *hydrogen*, the *oxygen* produced from the *hyper-oxy muriate* of *potass*. The *light* produced during the combustion of the *gaseous* mixture is, in the latter instance, fully as intense as that which is occasioned by burning *charcoal* with the aid of the most powerful *galvanic* battery.

exhibited sparks of a fiery red colour diverging from the focus in brilliant rays. The metal after fusion had a dull aspect, its surface being irregular and tarnished, like *pewter* that has been long exposed to the air of the atmosphere. A singular effect of heat was observed upon a polished lamina of *palladium:* instead of the blue colour usually given to this metal, by flame, when urged by the common blow-pipe, a beautiful *spectrum* appeared, displaying all the hues of the rainbow, and in the same order.

These experiments had taken place when we began to make trials of the *earths*. We began with *lime*, exposing to the flame a small portion of this *earth* in its greatest purity. It was supported in a cup, or crucible, which Professor *Cumming* had prepared by twisting spirally some *platinum* wire of the thickness already mentioned. This was no sooner exposed to the action of the ignited *gas*, than the vivid combustion and fusion of the *platinum* gave us reason to apprehend that the *lime* would disappear among the melted metal; it was however obtained in a state of evident fusion, its upper surface being covered with a limpid botryoïdal vitreous appearance somewhat resembling *hyalite;* the inferior surface, owing to a cause we have not ascertained, was quite black;* and the whole, when examined with a lens, appeared studded over with exceeding minute globules of *platinum*. In a second trial which we made with *lime*, some of the globules of the vitrified *earth* were of a wax-yellow colour; the *platinum* melting among it as before. A lambent *purple* flame always accompanies the fusion of *lime*.

Having thus succeeded in the fusion of pure *lime*, our next experiments were made with *magnesia*, and this *earth* became repeatedly fused; the fused mass in the several trials exhibiting either a porous glass, so light as to be driven off by the action of the gas, or else globules of a fine amber colour. The last happens when *magnesia* is supported by *pipe-clay;* the *clay* fusing with it upon *charcoal;* the *magnesia* after being mixed with *oil*, was reduced to a *slag*, which fell into a white

* Possibly owing to the presence of a small portion of *carbonic acid* retained by the *lime*, and which may have been decomposed.

powder again, and seems therefore to be *metallic*. The fusion of *magnesia* is attended by combustion, and the same coloured flame as *lime* and *strontian*.

We now began with *barytes*. The fusion in this instance was comparatively easy. The *barytes* was supported upon a crucible of *platinum*. It soon became fused, and exhibited a dingy metallic slag, looking like *lead;* but after a short exposure to the air it became covered with a whitish powder, and was restored again to the state of an *earthy* oxide.

Strontian was then exposed to the same test; when a partial combustion of the *earth* ensued, accompanied by a beautiful lambent flame of an intense amethystine colour: but the fusion here was slow and difficult. At last, after some minutes of exposure to the utmost heat of the *ignited gas*, there appeared a small oblong mass of shining metal in the centre of the *strontian*, (the rest being semi-fused) which Professor *Cumming*, owing to the lustre, suspected to be *platinum;* this, however, after being exposed to the air for a few minutes, again assumed a white *earthy* appearance.*

Silex and *alumine* were next brought under the action of the *blow-pipe*. The first became instantly fused, and exhibited a deep orange-coloured glass; which upon continuing the heat seemed to be partly volatilized, leaving a pale yellow transparent glass upon the *platinum*, which diffused itself in a thin superficies over the metal. The *alumine* was also melted with great rapidity, into globules of a yellowish transparent glass. In these experiments with the *earths* some changes were effected in the *platinum* used as a supporter, which ought to be noticed. When *lime*, *magnesia*, *barytes* or *strontian*, were melted upon *platinum*, this metal was deprived of its lustre, and its surface becoming tarnished, appeared to be covered with a thin scaly superficies resembling the *amalgams*, either of *mercury* with *silver*, or of *mercury* with *tin;* but when *silex* or *alumine* were

* It is necessary to remark here that the *metallic* appearances both in the instance of *barytes* and of *strontian*, were in all probability due to the *platinum* used as a support, although derived from the *metals* of these *earths*, exhibited in a state of alloy; because when *strontian* was subsequently fused in a crucible of pure *plumbago*, it was converted into a porous vitrified slag, of a dingy greenish colour inclining to yellow.

fused, no alteration of the *platinum* was observed. Owing to these changes in the *platinum*, and also to its constant fusion and combustion during these experiments, I substituted a small crucible of very pure *carburet* of *iron*, from the *Borrowdale* mine, and again exposed pure *lime* to the flame of the ignited *gas*. Nearly the same result was, however, obtained; the *lime* became fused; its upper surface exhibiting limpid transparent globules of glass; the only difference in the experiment being, that an evident combustion took place during the utmost intensity of the heat.

Afterwards the *alkalies* were severally submitted to the same test; but their fusion and subsequent volatilization took place with such rapidity, that they disappeared almost in the same instant that they came into contact with the flame.

The most infusible of the substances considered as *simple*, being thus proved to be incapable of resisting the action of such a fire, we made trials of the most refractory of the native *compounds;* and the following statement of the results obtained has been made, perhaps with as much brevity as the nature of the subject will admit.

1. *Rock crystal.* In the first trial the edges only were fused, and resembled *hyalite*. In the second trial the fusion was complete: the crystal appeared in the form of one of *Prince Rupert's drops;* having lost nothing of its transparency, but being full of bubbles.
2. *Common white quartz.* The same appearance after fusion as the *rock crystal.*
3. *Noble-opal.* Pearl-white enamel; fusion perfect. The *opal*, after fusion, has great resemblance to the stalactitic *siliceous pearl* of *Tuscany*.
4. *Flint.* A snow white frothy enamel; fusion perfect, and very rapid.
5. *Chalcedony.* A snow-white enamel; fusion perfect.
6. *Egyptian Jasper.* This substance contains so much water, that the decrepitation, even of its smallest particles, causes its dispersion when presented to the flame. To prepare it therefore for the action of the blow-pipe, Professor *Cumming* exposed it to a strong heat in a

covered *platinum* crucible; afterwards the particles were easily fused into a greenish glass full of bubbles.

7. *Zircon.* Becomes opake and of a white colour; its superficies only being fused, and exhibiting a white enamel like porcelain.

8. *Spinelle.* Fuses readily and undergoes partial combustion, with loss of colour and weight. One of the solid angles of an octahedral crystal was entirely burned off and disappeared.

9. *Sapphire.* A fine dodecahedral crystal of blue *sapphire* exhibited, during fusion, the singular appearance of greenish glass *balloons*, swelling out in grotesque forms, which remained fixed when the mineral became cool.

10. *Topaz.* A white enamel covered with minute bubbles.

11. *Cymophane.* Pearl-white enamel.

12. *Pycnite.* Snow-white enamel.

13. *Andalusite.* Snow-white enamel.

14. *Wavellite.* Snow-white enamel.

15. *Rubellite*, or *red Siberian Tourmaline.* Loss of colour—a white opake enamel; by continuing the heat, a limpid colourless glass.

16. *Hyperstene.* Jet black shining glass bead, with a high degree of lustre.

17. *Cyanite.* Snow-white frothy enamel; fuses very readily.

18. *Talc.* The purest foliated varieties of this mineral were fused, and exhibited a greenish glass.

19. *Serpentine.* Many different varieties of *Serpentine* were fused, and exhibited globules of an oak-apple green colour with an indented surface.

20. *Hyalite.* A snow-white frothy enamel, full of brilliant limpid bubbles. The specimens fused were selected from masses highly diaphanous, which invested the surface of decomposing *trap.*

21. *Lazulite.* Fused into a transparent and almost colourless glass slightly tinged green, and full of bubbles.

22. *Gadolinite.* Fused quickly, and exhibited a jet black shining glass with a high degree of lustre.

23. *Leucite.* Fused into a perfectly limpid colourless glass containing bubbles.

24. *Apatite* of *Estremadura.* This substance was fused into a white enamel resembling spermaceti in appearance. Some pure sparry *apatite* detached from a matrix of *magnetic iron* as found in *Lapland*, was fused into a chocolate brown glass, and became magnetic, owing to the iron; to which its colour was also due.

25. *Peruvian emerald.* Fused readily into a round bead of the most beautiful limpid glass without bubbles; having entirely lost its *green* colour, and resembling white *sapphire.*

26. *Siberian beryl.* This substance is often infusible with a common blow-pipe. It fused into a limpid glass containing bubbles.

27. *Potstone.* Fused very readily with combustion, exhibiting a remarkable appearance. The fused mass appeared as glass of a dingy walnut green colour, almost black; but when examined with a lens all the rest of the mass exhibited limpid needle-form crystals, highly transparent.

28. *Hydrate of magnesia*, or *pure foliated magnesia*, from *America.* This substance is more difficult of fusion than any other. I succeeded, however, with the utmost intensity of the heat, in reducing it to a white opake enamel, which was invested with a thin superficies of limpid glass. Its fusion was accompanied with a purple coloured flame.

29. *Sub-sulphate of alumine.* This substance admits of a very rapid fusion, into a pearl white translucid enamel. Its fusion is also accompanied by a partial combustion.

30. *Pagodite of China.* Readily fuses into a beautiful limpid colourless glass bead; exhibiting a high degree of lustre.

31. *Iceland spar.* Perfect fusion into a brilliant limpid glass, but with greater difficulty than any other substance excepting the *Hydrate* of *magnesia.* During the experiment a beautiful lambent flame, of a deep amethystine hue, exactly resembling that from *strontian*, was ex-

hibited; denoting the combustion of some substance: and this remarkable phænomenon characterises the fusion of pure *lime* and all its compounds.

32. *Common chalk.* Fusion into a yellowish grey enamel. By continuing the heat a clear pearly glass was obtained, resembling the *Silicious pearl* of *Tuscany.* The same purple flame appeared, as in the preceding experiment with *Iceland spar.*

33. *Arragonite.* Same fusion as pure *lime;* but difficult to obtain, owing to the crumbling disposition of the mineral when exposed to heat. Its fusion was accompanied by the *purple* flame as in that of pure *lime* and of *strontian.*

Combustion of the Diamond.

This experiment having often taken place at an inferior degree of temperature, was hardly necessary; but it was thought that a correct statement of the different appearances exhibited by the *diamond* during its combustion, might be interesting. We selected a fine octahedral diamond of an amber colour, weighing six carats.

At the first application of the extreme heat it became limpid and colourless; afterwards it appeared of a pale white colour; then it became quite opake and resembled *ivory*, being now diminished in bulk and weight. After this, one of the solid angles of the *octahedron* disappeared, and the surface of the *diamond* became covered with bubbles; next, all the solid angles were burned off, and there remained only a minute spheroïdal globule shining with a considerable degree of *metallic lustre;* lastly, every atom was volatilized; the whole experiment being completed in about three minutes.

Experiments with some of the Metals.

1. *Volatilization of pure gold.* As this experiment was attended with the developement of a peculiar colour during the dissipation of *gold*, which has not been before noticed, it will be proper to give a more explicit statement than in the preceding instances. That the metal might be exposed in its purest state to the

action of the ignited *gas*, I made use of it as precipitated from the solution of *tellurium* in nitric acid. A small quantity thus obtained was fused with borax upon the tube of a tobacco pipe, and reduced into a bead commodiously mounted for being brought into contact with the flame of the ignited *gas*. In the first action of the heat the light was so intense that the gold bead not being discernible in the midst of it, the operation was checked, when it appeared that the *pipe clay* had been fused, the *borax* having the appearance of a glass of *gold*, and the tube of the tobacco pipe being also invested with a shining surface of the metal, resembling *gold* that has been highly burnished. Around the whole, there appeared, upon the pipe clay, a *halo* of the most lively rose-colour, extremely beautiful, and, as to colour, not unlike the appearance exhibited by the *oxide* of *rhodium* when rubbed upon white paper. By renewing the application of the heat, the bead of *gold*, which had been considerably diminished in size, was nearly all volatilized.

2. *Burning of brass wire.* The combustion of *brass* wire, owing to the *zinc*, was very rapid; and it was accompanied by a flame of a *chrysolite* green colour, differing from that afforded by pure copper. The wire being held in a pair of *iron* forceps, the *iron*, towards the end of the experiment, began to burn with the *brass*; the unburnt part of it being also covered with a deposition from the *zinc*, in the form of a flocculent white oxide.*

3. *Copper wire.* Became rapidly fused, but did not burn.

4. *Iron wire.* Very stout *iron* wire was rapidly consumed: the

* The combustion of *brass* being thus attended by a deposition of the *flowers* of *zinc* upon the *iron* used as a support, a very easy test is afforded of distinguishing ancient *bronze* from modern *brass*. I made an experiment with some *bronze* discovered in a tomb near to the *London* road, between *Sawston* and *Cambridge*; which fused like pure *copper*, without combustion, and without any deposition of *zinc*; and found afterwards that it was a compound of *copper* and *tin*, or *bronze*. Owing to this circumstance, Mr. *Newman's* blowpipe may perhaps become as necessary to the cabinet of the *antiquary*, as to laboratory of the *chemist*.

metal during combustion exhibiting a vivid and highly brilliant scintillation.

5. *Plumbago.* This substance was fused into a *magnetic bead;* the fusion being attended with partial combustion of the *iron.*
6. *Red oxide of Titanium.* Fused, with partial combustion, into a dark-coloured bead.
7. *Red Ferriferous copper.* Rapid fusion, with combustion, into a black slag; by continuing the heat the metal was finally developed in its pure state.
8. *Blende*, or common crystallized *sulphuret of zinc.* This substance was fused and reduced to the metallic state; the metal appearing in the centre of the mass; but the parts most exposed to heat were volatilized and deposited in the form of a white oxide, which covered the charcoal used as a support. During this experiment the flame appeared of a *blue* colour.
9. *Brown and yellow oxides of platinum, precipitated from the solution of the metal in nitro-muriatic-acid, by the muriate of tin.* These oxides being placed in a crucible of *pipe-clay*, and mixed with a little *borax*, were speedily reduced to the metallic state, and appeared in the form of minute globules shining in the *borax* glass with great lustre.
10. *Grey oxide of Manganese.* This mineral contains so much water, that it was necessary to expose it for some time to a powerful heat in a crucible, to avoid decrepitation in the particles to be exposed to the ignited gas. It was afterwards fused with great ease into a metallic slag, which admitted the action of the file, and exhibited a shining metallic surface, having the lustre of *iron*, but somewhat darker.
11. *Metalloïdal oxide* of *Manganese*, crystallized in right prisms with rhomboidal bases. As this variety, according to *Vauquelin*, is the purest of all the ores of *manganese*, being destitute of *iron*, it was natural to expect that its reduction would exhibit the metal in a state of purity. It was instantly reduced to a brilliant *metal* rather

whiter than *iron*; it also burns like *iron;* sending out sparks during its combustion.

12. *Wolfram*, or dark *oxide* of *Tungsten*. This substance was readily fused, and as speedily reduced to the *metallic* state. It was first melted into a *black slag*, which by continuance of the heat was kept boiling upon *charcoal* for three minutes. It then exhibited a *metallic* bead, which upon examination resembled in appearance the *magnetic iron* of *Lapland;* not being however *magnetic*. It admitted the action of a sharp fine file, disclosing a *metallic* surface with a very high degree of lustre.

13. *Sulphuret* of *Molybdenum*. Became instantly fused, sending forth dense white fumes, and covering a pair of *iron* forceps whereby it was supported, with a snow-white oxide; among which, with a lens, minute globules of a silver white metal were discernible. The melted mass itself was reduced to a *metal*, upon which the file acted, and disclosed a *metallic* surface resembling that of *arsenical iron*.

14. *Siliceo-calcareous Titanium*. Some crystals of this substance were given to me by *H. Warburton*, Esq.; they had been brought by the late Professor *Tennant* from the *Sevres* porcelain manufactory. Having selected a very perfect and translucid crystal, and exposed it to the flame of the ignited *gas*, it was instantly reduced to the *metallic* state, being so far *ductile*, that when acted upon by the file and examined with a lens, it was evident that the teeth of the file had dragged it. This *metal* is of a brilliant white colour, and like all those obtained from the *brittle metals*, yet retains its metallic lustre, not becoming oxided by the action of atmospheric air. The surface also crystallizes in cooling; as do those of almost all the *metals* of this order.

15. *Black oxide of Cobalt*. Fused and reduced to the *metallic* state, it has a white silvery appearance, and is partly *ductile*. This substance being held by a pair of *iron* forceps, they became invested during its fusion with a

shining slag like black varnish. The metal does not become oxided by exposure to atmospheric air.

16. *Pechblende*, or *dark Oxide of Uranium.* Reduced to a metal resembling steel; but so exceedingly hard that the sharpest file will scarcely touch it. During fusion it deposits on *iron* forceps, a *yellow* oxide of the colour of the Canary bird.

17. *Siliciferous Oxide of Cerium.* Speedily reduced to the *metallic* state. A bead of the metal obtained by fusion exhibited *crystallization* upon its surface in cooling. It became covered with shining dendritic acicular crystals, like those of the *sulphuret of antimony*. Being afterwards filed, it exhibited a bright *metallic* surface, resembling that of *arsenical iron* in lustre and colour. This *metal* also preserves its *metallic* form unaltered by the action of the atmosphere.

18. *Cromate of Iron.* Fusible with ease into a dark globule, without any *metallic* lustre, but highly magnetic.

19. *Ore of Iridium.* I had proceeded thus far in my experiments, when I received a letter from Dr. Wollaston, recommending that a trial should be made of this substance. Professor Cumming accordingly supplied me with some very pure grains of the *ore of Iridium*, which *Dr. Wollaston* had sent to him. These grains were placed upon *charcoal*, and brought into contact with the ignited *gas*. At their first exposure to heat, they became agglutinated and partially fused, shining in the parts where fusion had taken place with a bright *platinum* lustre. After placing the agglutinated mass of *Iridium* upon *plumbago*, and continuing the heat, the fusion was perfected. The *metal* then boiled, and began to burn with scintillation, depositing a reddish coloured oxide upon the *plumbago*. Nothing then remained but *glass;* in which state it was sent to *Dr. Wollaston*.

In thus describing the action of the ignited *gas* upon those substances which were hitherto considered as being *infusible*, it will be proper to add, that there are many other minerals

improperly classed as *infusible* by some chemists and mineralogists, which are *fusible* by means of the common blow-pipe; and therefore they have nôt been included in the list. Of this number, are *jada*, *mica*, *amianthus*, *asbestus*, *&c.* all of which melt like wax before this powerful apparatus. Again, there are other substances often described as being *fusible*, which are not so by means of a *common blow-pipe;* of this number is the diaphanous *marekanite of Kamschatka*, considered as a variety of *obsidian;* and which appears in *pseudo-crystals* of the *garnet* form, or rhomboidal dodecahedrons. I never was able to effect even the slightest appearance of *fusion* upon the minutest particles of this mineral, although I have exposed it during a quarter of an hour to the utmost heat of the flame of a *wax* candle, urged by the common *blow-pipe.* When brought before the flame of the *ignited gas*, the fusion was slow and tranquil. The *marekanite* then exhibited a small globule of limpid colourless glass, like that of rock-crystal after fusion; but having a high degree of lustre and transparency, and being free from bubbles.

To enter upon a detail of the changes produced in bodies that were before known to be *fusible*, would extend this article to too great a length for insertion in your Journal. I shall therefore confine the rest of my observations to those results which I obtained by a renewal of my experiments upon the *earths;* whereby I was enabled to establish, beyond a doubt, the *metallic* nature of *barytes* and *strontian*, and to exhibit the *metals* obtained from those *earths*, in the presence of the gentlemen before mentioned, and of other members of the University. I also obtained, in one instance, a *metal* from pure *silex*, which still retains a greater degree of *metallic lustre* and *whiteness* than the purest *silver;* but this last *metal* I have not been able yet to reproduce in a manner altogether satisfactory. To begin therefore with *barytes*.

Having obtained a portion of this *earth* in a state of purity, I mixed some of it (*August* 20,) with *lamp oil*, and rubbed both together in a *porcelain* mortar, into a paste.* This *paste* being placed upon *charcoal*, was brought to the *ignited gas*,

* This process however is not necessary. I have subsequently found that

and kept exposed to its most intense heat, for some minutes.* By this means it was fused, and assumed the form of a black shining *slag*, like that of *iron* from a foundry. A small portion of this *slag* was then held, by means of a little *borax*, upon the end of the tube of a tobacco-pipe; and again exposed to the *ignited gas*. The *slag* being now firmly fixed upon the pipe-clay admitted the action of the file, and exhibited a shining *metallic* surface, resembling that of silver. This experiment was repeated many times, sometimes with *charcoal*, and sometimes without, and always with the same result. In every instance, the *slag*, when filed, exhibited *metallic* lustre, which when the *metal* was pure appeared brighter than *silver*; if imperfectly obtained, it resembled *lead;* and sometimes it had hardly any *metallic* lustre and resembled *horn*. I then determined to watch the effect that might be produced by keeping the *slag* upon *charcoal* during a long continuance of the heat. For this purpose, I consumed three measures of the condensed *gas*, from the reservoir of the *blow-pipe*. The *slag* was reduced to a *yellowish* glass; and the flame was tinged, during the utmost intensity of the heat, with a *chrysolite-green* colour. Believing from the appearance of this *glass* that I had continued the heat too long,† and that the *metal* was consumed, I tried what effect would be produced upon it by moisture, by placing it in a wine-glass half filled with pump water. It began slowly to decompose the water; there falling off into the liquid, from the surface of the glass, a whitish powder. I then added some *nitric* acid; but the solution being very slow, and almost imperceptible, I took out the small lump of glass, and having examined it with a lens, perceived that a dark substance, resembling *lead*, existed towards the centre of the mass. Bringing it therefore again to the action of the *ignited gas*, it became fused once more into a black shining *slag*, in all parts that

the earth of *barytes* is instantly reducible to the *metallic* state, without any addition either of *oil* or of *charcoal*.

* The heat may be always graduated by increasing or diminishing the volume of gas from the aperture as the screw of the stop-cock is turned.

† Many subsequent experiments have convinced me that *charcoal* has the property of *vitrifying* the *metals* of the *earths* during their reduction; and that it is better not to make use of it in these experiments.

were brought into contact with the flame; and this *slag* after being filed, *disclosed* a brighter surface of *metal* than any that I had yet seen. I can only compare it as to colour and lustre to the purest *silver*, and it seemed to be equally ductile. In the space of three minutes, however, it became oxided, but the *metallic* lustre was again renewed by the application of the file, until at last the whole of the *metal* was filed off, and a dull slag which was not metallic remained, with a degree of lustre resembling the appearance of horn. The nitrous solution whence it had been taken, exhibited, to the *prussiate of potass*, a copious precipitate of a deep *green* colour; but this precipitate may be due to impurities both in the *water* and in the *acid*. The existence however of the *metal* of *barytes* no longer admits of the smallest doubt. As it will be necessary to bestow some name upon it, and as any derivative from Βαρυς would involve an error, if applied to a *metal* whose *specific gravity* is inferior to that of *manganese* or *molybdenum*, I have ventured to propose for it the appellation of PLUTONIUM; because we owe it entirely to the *dominion of fire*. According to *Cicero* there was a *temple* of this name dedicated to the *god of fire*, in *Lydia*.

Afterwards I pursued nearly the same course with *strontian*, and obtained from it repeatedly a *metal*, like that of *barytes*; the *strontian* burning, as usual, with its beautiful purple flame. This metal retained its lustre for many hours, but at last it became *oxided*, and appeared in the *earthy* state again. I have called it *strontium*, as recommended by *Sir H. Davy*, in the account of his experiments for the decomposition of the *earths*.* Afterwards pursuing the same process with regard to *silex*, I obtained in one instance a brilliant bead, of pure white *metal*, which I have called *Silicium*, for the same reason; but this metal I am at present unable to re-produce. Indeed a temporary suspension of my experiments has taken place, in consequence of a circumstance which I shall now mention.

A great deal has been said of the danger attending these experiments: it may concern your readers therefore to know

* See "*Electrochemical Researches on the Decomposition of the Earths*," &c. Read before the Royal Society, June 30, 1808, p. 14.

that during one entire month, in which I have been employed uninterruptedly in experiments with the *blow-pipe*, I have met with no accident. My tube of glass, as represented in the wood-cut by A, was at first three inches in length, and the bore of it was at least $\frac{1}{70}$ of an inch in diameter. During these experiments, the end of the tube was constantly breaking, owing to sudden changes of temperature, until at last I worked daily with a tube only $1\frac{3}{8}$ inch in length. It has been said, indeed, that "*the danger lies in the chance of a retrograde movement of the flame, which may be drawn backwards towards the reservoir, and thus cause it to explode.*" I have seen this *retrograde* movement of the flame, very often; it happens when the current of *gas* is feeble; either when the reservoir is nearly exhausted, or when the current is suppressed in the beginning of an experiment. But then the flame is instantly extinguished by turning the valve; and if it be not thus extinguished, it will be drawn backward only about half an inch, when, after splitting the end of the glass tube, it goes out of itself. Being resolved however to observe what the effect of actual explosion would be, we condensed about four pints of the explosive mixture into the reservoir, which was all that it was capable of containing, and having tied a long string to the handle of the valve, we took out the glass tube, A, leaving the gas to rush against the flame of a spirit lamp, through an aperture nearly $\frac{1}{8}$ of an inch in diameter. Professor *Cumming* held the string, and opened the valve, standing within about six yards of the apparatus; the rest of us were dispersed towards the extremity of a large room in which the *Chemical* Lectures are delivered. Upon opening the valve, the whole of the gas exploded, with a noise nearly equal to the report of a cannon; and with such violence, as to tear open the copper reservoir, C, one part of which being driven against a wall, was bent double. The stop-cock was also blown out. That danger, therefore, may arise from too large an aperture, is evident; but with the proper precautions an explosion is rendered impossible. I shall continue my experiments with a similar apparatus, and with a much larger reservoir, as soon as it can be prepared.

To conclude, I consider this improvement of the *blow-pipe* as one of the most valuable discoveries for the sciences of

Mineralogy and *Chemistry*, which has yet been made, and I have no doubt but that the use of such an apparatus will become universal. Its portable form, the great ease of conducting the experiments, and the advantages afforded in being able to stop the operation at pleasure, so as to observe all the changes that ensue, and thereby to watch the progress of every analysis that may take place, give it a decided superiority over every contrivance that has hitherto been adopted; and when to all these is also added the wonderful fact, that, by means of an apparatus so diminutive, a degree of heat is produced surpassing that of the most powerful *Galvanic battery*, it will surely be allowed that the inventor of this blow-pipe is entitled in no common degree to the thanks and praises of his contemporaries.

I have the honour to be, &c. &c.

EDWARD DANIEL CLARKE.

Cambridge, Sept. 1, 1816.

P. S. *Sept.* 14. Since the foregoing letter was written, I have renewed my experiments. I no longer find it necessary to use *oil* or *charcoal*, in obtaining the *metals* of the *earths*. The *metal* of *barytes* is obtained directly and almost instantaneously from the *earth* itself. I have estimated the specific gravity of the *metal* of *barytes*, and find it to equal 4.000. But as bubbles of *hydrogen* adhere to the *metal* during the experiment, owing to the decomposition of the water, and as it becomes rapidly oxided and falls to powder, this estimate may be too low. Yesterday I placed some pure *silver* in contact with the *metal* of *barytes*, and fused the two metals together; the result is an *alloy* of a darker hue than *silver*, somewhat resembling granular *tin* or *lead*. By continuance of the heat, the *silver* is dissipated in dense white fumes. If the name which I have proposed for the *metal* of *barytes* be adopted, this *alloy* may be called *plutonial silver*. I afterwards tried a similar experiment with *gold*, but the two metals did not combine. No change was effected in *plutonium*, simply by bringing it into contact with *mercury*. Its action upon *Palladium* is of a very peculiar nature: when placed upon a polished *lamina* of this metal and heated by the ignited gas, it spreads over the surface, in ap-

pearance resembling a *bronze* varnish, and thus forms an alloy with it, until the *palladium* begins to fuse. When fused upon *platinum*, it gives to this metal a superficies resembling polished *brass*. One of the most remarkable results which I have obtained by means of this blow-pipe, is that of IRON, from METEORIC STONES; all of which are reducible without any diminution or increase of weight, to *iron;* admitting the action of the file, and disclosing a bright *metallic* surface, and being highly *magnetic*. This *iron* resembles that which whitesmiths call *iron blubbers* in *clinker;* and it has the same specific gravity; not exceeding 2.666; the metal being nearly in the state of *slag*. Hence it follows, that for the fall of *iron* from the atmosphere, nothing more is requisite than that the *stony concretions* which form in the atmosphere should undergo a greater degree of heat, than that which has attended their deposition when they descend in the form of *stones*. I exposed this day, *eight* grains of one of the *meteoric stones* that fell at *L'Aigle* in *Normandy;* to the action of the ignited gas; it became speedily fused, and exhibited a black *slag;* by continuance of the heat, this *slag* began to boil, and was reduced to a bead of *iron*, weighing exactly *eight* grains. The further consequences of this remarkable fact, I must for the present leave to the reflections of your readers. If the heat be too long continued a combustion of the *iron* ensues, attended with the usual phenomena.

Some Remarks on the Arts of India, with Miscellaneous Observations on various subjects. By H. SCOTT, M. D.

[From the Journal of Science and the Arts, No. III.]

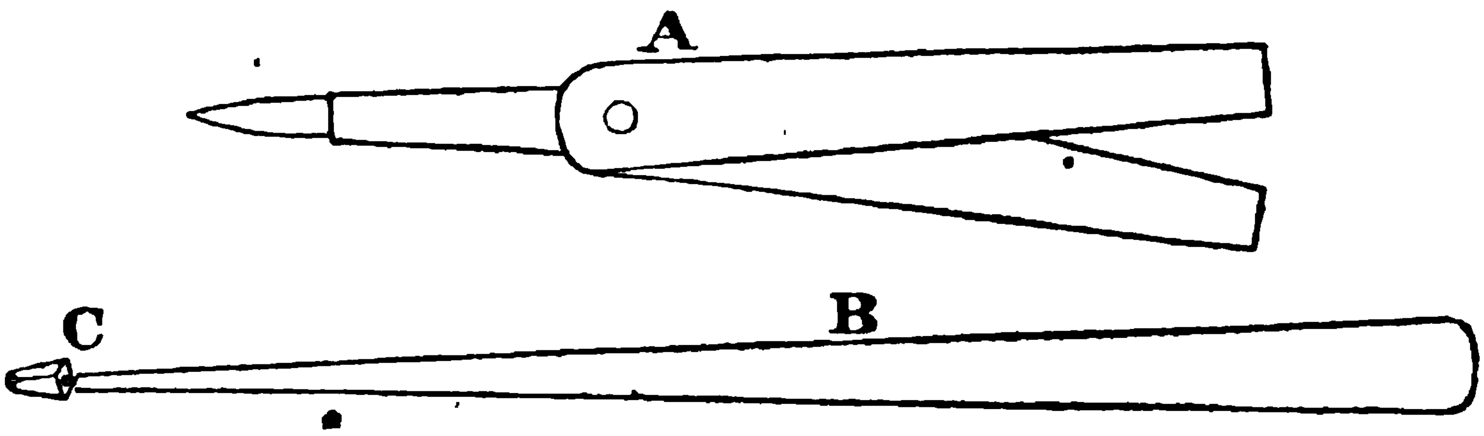
I HAVE hesitated a good deal with regard to the subject which I should choose for this paper, from the great variety that present themselves to my mind. I have fixed at last, on the most important operation for the cure of blindness that has yet been practised in any country—the removal of the crystalline lens when it becomes opake. At what period this dis-

covery was made in India will, I fear, never be known, nor to what demigod we are indebted for so great a relief to suffering humanity. It is probably very ancient; for ages have, I think, passed away since much addition has been made to knowledge in India. It cannot be supposed that a people so often invaded by barbarians, so often subjected to a foreign and cruel dominion, should have leisure or ability to make and preserve observations of this kind. But whatever may be the origin or antiquity of the operation of India for cataract, I know that it is occasionally very effectual. That it renews to many melancholy beings their long lost communication with the external world, and brings them once more "within the precincts of the cheerful day."

I cannot venture to say that the Indian operation for the cataract is worthy of our imitation; this must be decided by those better qualified to judge than I can pretend to be. I shall confine myself to a plain narration of what I have actually seen, with such observations on it as have arisen in my mind. I think I have been a witness of this operation four times, and performed by two different operators. Those people occasionally travel to a distance to practise their art, but I believe they never leave their homes unless on being called to some certain employment. All those that I saw in Bombay, were Moormen, and their general residence was in Guzurat. One of these practitioners was a young man, the other aged; they came at different times, and were unconnected with each other. The young man had, I think, the most skilful hands of any person that I ever met with. He seemed to feel every thing that he touched with as much delicacy as a spider, and the operations which I saw him perform were executed with surprising skill. Celsus observes that a surgeon ought to be a young man, or of an age approaching to youth. "Esse autem Chirurgus debet adolescens, aut certæ adolescentiæ proprior." The feeling, the elasticity, the pliability of youth, with its perfection of sight, are never more necessary than in the operation for the cataract.

I have, unfortunately, not brought to Europe the Indian instruments for couching, but I have had a set made here by an ingenious workman, from my recollection of them. They can-

not be far from affording a true representation. The first instrument, A, is for perforating the coats of the eye. It is sharp-



pointed, but soon becomes thicker than a common lancet. This seems to be necessary, for two reasons: 1st, to avoid the risk of its breaking, from the thickness and density of the sclerotic coat; and, 2dly, to make an opening of sufficient size to pass the instrument B, for depressing the lens. The instrument A is made of steel, but B, I have always seen made of brass. About the 4th or 5th of an inch above the point of the instrument A, they wind a thread for preventing its passing farther into the eye than is intended. It is a curious circumstance, that the opening made through the sclerotic coat is at the very point where it is now made in Europe; that is, behind the edge of the cornea, and about, or a little below, the axis of the eye. My skilful operator desired the patient to look at a particular object, and in a moment he pierced the eye at the very point which he ought to have done, and without using a speculum to fix it.

When an opening is thus made through the sclerotic coat, the instrument A is withdrawn, and that marked B, introduced. This instrument may be described as a cylinder, terminating at one end in a pyramid of three sides, with a blunt apex. Between the cylinder and pyramid, at their junction, is a neck, or part somewhat smaller than the rest, as marked at C. On being inserted, it is so managed as to push down the lens below the pupil. This is done slowly, but effectually, twice or thrice, the operator looking attentively for a little time afterwards at the eye, to be convinced that he has quite removed the lens, and placed it below the transparent cornea. He then slowly draws back the instrument till he finds that it

hangs from the narrower portion, or shoulder, at C. In this position it produces no kind of irritation, while the strength of the sclerotic coat keeps it from falling out entirely. Both eyes are then covered carefully with several round cushions of cotton wetted with water, so that the patient is in perfect darkness. With the eyes so covered, and with the instrument still in the perforation, the head of the patient is allowed to rest on a pillow for 15 minutes, or even half an hour, till the spasms that may have been excited in the eye have entirely ceased. They are then uncovered and carefully examined. If the lens or any part of it has risen, it is again depressed by the instrument B. They are a second time bound up as before, for a like period of time, and then re-examined, to ascertain if any farther depression is necessary. This process is even gone through a third time, so that their operation is tedious: it requires a long time, but it seems not to give any material degree of pain or uneasiness. When in this way they are quite satisfied that the lens is sufficiently removed, they tie the wet cotton cushions over both eyes, and put the patient to bed. He is kept there in darkness and repose for about a week, living on little else than boiled rice.

When I first saw the Indian instruments for couching, I looked on them with contempt. I thought the instrument B, in particular, clumsy and ill fitted for its office. But experience has altered my opinion. Its size is perhaps of advantage, for by means of it the lens is readily removed, while its coat is completely torn and detached. There is thus less risk of the lens returning to its former position, while its absorption is promoted and ensured.*

If any person will consult Celsus, he will find that his operation for the cataract does not differ from the present practice of Europe, and no doubt gave rise to it. He perforates the eye with the same needle (acus) that he uses for depressing the lens; and he advises, if the lens cannot be kept down, to cut it to pieces with this acus; so that his instrument must have had both a sharp point and a cutting edge: "si hæsit

* Celsus seems to be of this opinion—for he says "tum acus admovenda est, aut acuta, aut forte *non nimium tenüis*."

(says Celsus) curatio expleta est, si subinde redit, eadem acu concidenda et in plures partes dissipanda est; quæ singulæ et facilius conduntur et minus late officiunt."

There is sufficient evidence that the astronomy and the Algebra of the Hindoos had a different origin from what we have learned of those sciences from the Greeks or Egyptians. May not the same observation be applied to the subject of this paper? From whatever source the operation of Celsus reached the Greeks, and through them, I suppose, the Romans, it differs so much from the method of India, as may lead us to think that they had not a common origin. Facts like those would lead me to suppose that there never existed more than a very partial or a very temporary intercourse (such as now takes place) between India, Egypt, and Greece. The recent introduction into Europe of the Arabic cyphers or digits affords, I think, a proof of the same kind. It has been supposed that a knowledge of them was first brought from Spain to France before the year A. D. 1000, by the justly celebrated Gerbert, and that he had learned the use of those figures from the Saracens, who had settled in that country. The introduction, however, of this method was probably much later than the time of Gerbert. Mathew Paris calls them the Grecian numerals, and says they were brought from Athens by John Basingstoke, about the year 1240. I have no doubt but that we owe to India, and not to Greece or Arabia, this inestimable invention. The forms of those Arabian or Grecian characters are nearly the same with those we use at present, and the whole mode of employing them for the expression and management of numbers is exactly the same. How superior is this to the numeral letters of the Romans!—Does not our comparatively late knowledge of this noble invention afford an additional proof that the extensive connection between India, Egypt, and the more Western world (which has been supposed to have existed) could never have taken place? Such an argument appears to me far more conclusive than the sounds of words, uncertain etymologies, or geographical conjectures. The wanderings in the East of shepherds or of tribes in the early periods of society, with regard to which so much has been said, may be ranked with the stories of the Arabian

Nights, and are in my opinion about as authentic and useful.

I asked my Indian operator by what means he had acquired his knowledge of this operation. He replied, from his father. They practised it from father to son. He had never seen the dissection of the eye of any animal, nor does he believe that any of his family had. In spite of all this, it is impossible not to think that the knowledge of this very delicate operation must have been derived from actual dissection; for an error, even of a small space, would inevitably lead to a destruction of vision for ever.

I was so struck with the skill of this man, that I was very anxious to ascertain from him the general result of his practice, the proportion of his successful and unsuccessful operations. He acknowledged at once that he kept no register nor account of them; but on my pressing him much to make some conjecture of the number in one hundred who were improved by the operation, and of the number who received no benefit from it, he said, after a good deal of hesitation, that he did not think above five in one hundred remained without benefit. I had no means of ascertaining the real state of the question with more certainty; the man was a stranger and soon returned to his country, and I never saw him again. I leave it to the reader to form his own conclusions on this subject. He could have but little interest in deceiving me; but, as is too frequently the case, he might wish to give himself consequence by magnifying his success; he might have forgotten many of his failures; and without supposing that he meant to mislead me (which I should reluctantly do), we ought probably to make a large deduction from the favourable side of the account.

I shall say nothing of the remedies used by the Indians for inflammations of the eyes, for that is a subject purely medical, for which this is not an appropriate place; nor indeed do any of their remedies produce such effects, as I should judge to be peculiar, or very interesting. So far as my own experience goes, I am disposed to think that the ophthalmia of Egypt, like the plague of the Levant, or the typhus fever of Europe, cannot be propagated from one man to another in India, but that its infection or contagion is rendered inert by the unceas-

ing heat of that climate. I can suppose that an increase of temperature may induce those poisons to enter into new combinations with the air, or some of its component parts.

H. Scott.

38, *Russel Square, August* 2d, 1816.

P. S. Does any thing like the operation that I have described appear in the medical writings of the Arabians?

Account of the Winter Epidemic of 1815-16, *as it appeared in and adjacent to Columbia, S. C.* By Dr. James Davis. Pamphlet; printed at Columbia, S. C. 1816.

The late pestilential epidemic catarrh, which has occasioned a greater mortality than Carolina ever before experienced from any other epidemic, commenced in the town of Columbia early in last November, in the form of common colds, immediately after the disappearance of our autumnal bilious fever. These colds were unusually rife for that season of the year, and the symptoms of them were coughs with some rawness and soreness of the pipes and chest, and occasionally slight soreness of the throat with some fever.—The head was never affected. Although this disease now assumed this mild appearance, it was easy to discover from the sallow complexion and languid condition in which it left the patients even after slight attacks, that there was more malignity in it than in a common cold. The successful method of treatment also pointed out a difference between them, as, after cleansing the first passages freely with cathartics, a liberal use of the bark proved a speedy and certain method of cure; which would not have been the case in common colds. In many instances the degree of morbid affection was so slight as not to require the aid of medicine; and in these cases their duration was from one to three, four or five weeks, according to the employments and habits of the subjects of them, in remaining within doors, or in being much exposed to alternate changes of the external atmosphere with the attemperated air of a chamber.

By the latter end of November and the beginning of December, these colds began to wear a more serious complexion; the worst cases assuming the type of violent pneumonia, while the more ordinary cases began to be accompanied with severe fevers and local affections of the parts about the head. By the middle and third week in December the disease had become truly alarming.—Several mortal cases had occurred, accompanied with symptoms of malignity, and the subjects of it were multiplying every day. By the middle of January it may be said to have reached its acme, and by the second week in February to have nearly subsided. It however is not yet entirely passed off, for upon the recurrence of every damp cold day or two a few severe cases immediately appear; and a slight sore throat, which is at this time unusually rife, must be considered as a modification of the same disease. During these ten or twelve weeks of its prevalence it manifested considerable malignity, and left but too many to painfully remember the winter of 1815-16; nevertheless I apprehend its violence and mortality have been greatly exaggerated. Its mortality was considerable, it is true, but there can be no doubt, from authentic information, that several other places, as Williamsburgh, Newberry, and the vicinity of Cambridge, have suffered incomparably worse than we have done. I do not mention this circumstance because it is any consolation that other places have suffered more than Columbia, but to remove improper impressions with regard to this place; for in this respect it has been egregiously misrepresented.

Every serious case of this epidemic was ushered in by a chill, with an unusual aching of the joints and extremities of about two or more hours duration. A few hours before this chill, in very many cases, sudden, acute and excruciating local pains in some part of the body, but especially about the face and head, as in one tooth, one ear, the orbitary bones of one eye, one side of the maxillary bones, one side of the head, the bones of the nose, or perhaps still more remotely, a pain in one knee would appear, whilst the subject was in perfect health, as precursors and premonitors of the approaching disease. The circumstance of a formal chill at the commencement afforded a certain prognosis of the nature of the future disease,

whether it was to be a light or a severe one. Not a single case of a severe nature occurred without this symptom, and not one which was marked with it, that did not prove exceedingly violent. The measure of severity and danger might also be predicted with considerable certainty from the severity and length of the chill, as the violence of the disease was generally correspondent to the severity of this symptom.

A fever immediately succeeded the cold stage, and perhaps in nineteen cases out of twenty, within the first twenty-four hours, a pain began to form in some part of the thorax, attended with cough, constituting pneumonia. This pain continued to increase in violence, spreading and occupying a more extensive portion of the chest, until in some instances it seemed to have pervaded the whole region of the thorax, or shifting from one part to another, for nine, ten or eleven days, when a crisis occurred either by expectoration, perspiration or urinary depositions, or by all three of them, and the disease gradually solved.

In pneumonic cases the pulse was seldom hard, but was very quick and manifested great irritation. The warmth of the skin was not very ardent, but until near the crisis was generally disposed to be dry. About the third day and sometimes on the first, the tongue became covered with a yellow fur. The thirst was not generally considerable, but short paroxysms of it occurred in which it was excessive. There was seldom much pain in the head, and yet there was almost constantly present a slight alienation of mind. There was some expectoration from the beginning of the cough; at first it was commonly a little bloody, but frequently only a tough glairy phlegm. The urine during the disease was a little diminished in quantity and of a high red colour. Muscular strength was considerably prostrated and the patients suffered much anxiety. The sleep was greatly disturbed. The respiration was hurried and frequently performed with a little catch, as if from some obstruction, even when the pain in the chest did not appear to be very acute; but it seldom amounted to dyspnœa, except in fatal cases, and then, for a few hours just before death, it was excessively severe, suggesting an idea that the chemical function of the lungs was suspended, rather than that they were

rendered impervious from infarction or mechanical obstruction. The cheeks were often marked with a circular blush which in some cases was of a remarkably deep crimson colour. Upon the whole, however, the apparent difference of symptoms between these cases and ordinary cases of sporadic pneumonia was not very striking. The difference chiefly consisted in the greater danger attending the epidemic cases, and the unsuccessful result of the remedies usually employed in sporadic pneumonia.

Towards the ninth, tenth or eleventh day the expectoration became more easy and copious, the matter of which was generally yellow.—Spontaneous and comfortable perspirations burst forth. The urine became more abundant and turbid, deposited a copious mucous sediment, and the disease gradually terminated.

This was the train of symptoms that appeared in the generality of pneumonic cases; but not in all. There were some in which the arterial actions were prodigiously energetic, and in which there was scarcely any reaction in the blood-vessels, exhibiting every mark of the greatest debility compatible with life. These latter cases were more embarrassing to the physician than the former, but nevertheless did not prove to be more mortal. They ran the same course, had similar crises, and terminated about the same time with the kind of cases above described.

Besides the pneumonic form of this epidemic, which was here the predominant form and occasioned nearly all the mortality in this community, we also had three other types of it. The pneumonic form in all serious cases was so greatly predominant, that perhaps we should not depart very far from propriety to denominate the disease an epidemic pleurisy or peripneumony, rather than that of an epidemic cartarrh. The next most prevalent form exhibited a determination of disease upon the brain and meninges with violent pain in the head, suffused countenance, redness of the eyes and delirium. In another, the disease fixed on the blood-vessels only, in the form of violent fever; and in the third, but in very few instances, there was a local determination to the throat producing cynanche pharyngæa. The difference of symptoms between

these types and the pneumonic type chiefly consisted in the usual symptoms arising from the parts locally and most violently affected; except perhaps that the vascular actions were generally more energetic in the former than the latter; and that cough did not attend on the former so early in the attack as it did in the latter. In the head, fever and throat cases, the cough supervened, and about the ninth, tenth or eleventh day an expectoration of yellow matter came on together with spontaneous perspirations and urinary depositions— and the disease gradually solved. It is here worthy of remark that whatever type the disease assumed the symptoms attending the crisis were the same; and perhaps there is no disease in which these symptoms are more uniform and essential than they were in this.—These kinds of evacuations appeared to be those which the nature of the disease pertinaciously required for its solution, and it appeared that none others either natural or artificial could be successfully substituted for them. Not a single case recovered, so far as I am informed, without one or more of these evacuations, however long the period of crisis might have been deferred.

In the cure of this disease, as I above remarked, in its first approaches, the cases were readily managed with purgatives, and the subsequent use of the bark; but when it arrived to its full strength the bark was no longer admissible except in the state of convalescence. During its whole reign, however, it exhibited various degrees of morbid affection, and very many cases occurred in which it was only necessary to recommend confinement to the uniform atmosphere of a chamber, a spare diet with perhaps some gentle tonic medicines, as the infusion of quassia or the bark.

In treating the pneumonic cases, it was readily to be perceived, that bleeding, our chief remedy and principal dependance in sporadic pneumonia, was not the leading remedy in this disease. For although it was frequently useful and sometimes absolutely necessary to have recourse to it, yet the benefit derived from it even in these cases, and where there was considerable inflammatory diathesis with violent local affection of the chest, was not equal to my expectations, nor to what I had been accustomed to obtain in sporadic pneumonia. This

disease was decidedly of a bilious character, modified by the influence of the cold season into the form of catarrh. In some cases a redundancy of bile was manifested by the immense discharges of it by evacuants, and in others where it did not appear to be so abundant, yet we have reason to believe from the acrimony of the discharges and from its appearance that a vitiated state of it was the cause of the disease. In many cases towards the decline the complexion assumed the bilious hue, and in some a true jaundice supervened in the midst of the attack.

The remedies most uniformly useful, and which ought to be considered as the chief and leading remedies, were *cathartics*, *diaphoretics*, *anodynes* and *epispastics*. In cases of very energetic arterial action venesection was absolutely necessary; and in cases of less vascular energy, when the local inflammation in the chest was fixed and extremely acute, small bloodlettings were useful and even essentially necessary to save the lungs from immediate destruction. But in general it was requisite to be extremely guarded in this operation, and to take away no more blood than was absolutely necessary to rescue some vital part from immediate mischief. In cases of very strong arterial action, or of excruciating pains of the chest, it was necessary to abstract blood until these symptoms were moderated and reduced down to that point which a skilful judgment could determine no longer threatened immediate destruction. But more than this evidently did mischief, either by protracting the crisis far beyond the natural period, or by suppressing the critical evacuations altogether; and by leaving the patients to struggle under a tedious debility during a long protracted convalescence.

The blood was most generally buffy in every stage of the disease in which it was drawn; but frequently not until the third, fourth or fifth day. The buff was commonly of a yellow colour; and in some instances the coagulum was imperfectly formed, being of exceedingly loose texture with a liquid kind of buff floating over it, exhibiting almost a semipurulent appearance.

Neither the buffy appearance of the blood nor the obstinacy and unmitigated state of pain, afforded those just criteria for

repeated venesections, as in sporadic pneumonia. It was necessary that the physician should not be over anxious to subdue these symptoms to that point of moderation which he was accustomed to do in common pleurisies, but to wait the critical termination; trusting the resolution of a much higher degree of remaining local inflamation to the evacuations of expectoration, &c. attending the crisis, than would be justifiable in sporadic pneumonia.

Refrigerant cathartics, such as the sulphat of soda and the sulphat of potash, were the most useful; and it was necessary to repeat them every day or every other day during the disease; and to employ the intervals with diaphoretics and anodynes. The most servicable diaphoretics were the pulv. antimonial. or the James' powders, and powders composed of tart. emet. and sal. nitri. The anodynes, either the elixir paregoric or laudanum, were best given at night, to compose the irritation and to co-operate with habit in inducing a comfortable sleep. It would be natural to fear that the anodynes might have an effect in repressing expectoration; but so far from it, they usually repressed only a harassing fruitless cough during the night, but promoted the expectoration when the cough returned in the morning. It was proper however, not to resort to this remedy too early, nor until after the morbid excitement had been somewhat reduced; and if in the course of the disease the morbid excitement suddenly increased, it might be proper to intermit its use. It is unnecessary to add that the anodyne ought always to be so given as not to interfere with cathartics.

This was the general mode of treatment which I found most successful in every type of this epidemic. The difference of type requiring no other difference of treatment than some local applications suited to the parts most violently affected, except in the cases attended with extreme debility, where it was necessary to have recourse to some diffusible stimulus and cordial. The warm aromated toddy, as being most grateful and convenient, was generally resorted to.

In chest-cases, epispastics on the seat of the pain, especially if fixed, were beneficial. In cases of the cynanche, when not violent, the volatile liniment combined with a solution of cam-

phor in Sp. Terebinth. was very serviceable, but in violent cases epispastics to the throat were indispensably necessary. Such gargles as best promoted a secretion from the fauces were useful, and for this purpose the simple forms, as warm sage tea with honey and sal nitri, were perhaps as good as any others. In head cases epispastics, when applied to the back of the neck, were strikingly beneficial; and I was informed of one case which approximated nearly to phrenitis in which an epispastic over the whole of the shaved scalp, afforded immediate relief. In mere fever cases blistering was most usefully performed on the extremities.

Soon after the solution of this disease the appetite of hunger frequently returned very suddenly, and was remarkably ungovernable; in these cases it was necessary to restrain the patient in the quantity of his food, but his appetite craved a generous diet, and it was useful to indulge it; a poor meagre diet only served to keep up a state of debility and langour but too common after this disease, and to protract the convalescence.

I have faithfully endeavoured to comprise in this communication an accurate history of the rise and progress, type, symptoms and cure of this epidemic. I am happy to be able to add that Doctor E. D. Smith, professor of Chemistry in the South-Carolina College, who during my own illness with the disease, was necessarily drawn into the practice for several weeks from the scarcity of medical aid, and to whom I showed this communication, confirms the statements I have made as accordant with his own observation and experience. And as, from authentic reports, this disease has assumed very various shapes in a great number of places, it is much to be desired that similar communications could be obtained from every place in which it has appeared. The History of Epidemics is at all times interesting to the physician and the philosopher; and yet no diseases are involved in greater obscurity. In the profession of physic, where the practitioners are considered as the guardians of health, the community at large have a claim upon their exertions; hence moral duty should stimulate them to every information that may tend to general good. It is beneath the dignity of a physician to consider himself the object of his own attention; he should deal out his bounty

with a liberal hand, and let his observations and experience be diffusive.

PART II.

Peculiarities and Anomalies of the late Epidemic.

This subject would appear at first view to be more curious than useful; but when it is considered how far the peculiarities and anomalies concomitant on a disease may tend to establish the identity of its character, it will be found not to be destitute of utility. It may also be of importance to the practitioner, upon any new recurrence of the disease, to be apprised of its anomalies and the consequences to which they lead, and thereby be saved from those perplexing embarrassments which new and singular appearances sometimes impose upon him.

It has been the practice of medical writers to denominate all catarrhs which have prevailed epidemically by one common appellation implying an identity of character. "From Sydenham upwards to Hippocrates, the epidemic catarrh was known and is mentioned by the name of catarrhalis febris epidemica. Since Sydenham's time it had been variously named, but is now generally known by the name of influenza." How far this may be correct and proper requires investigation.

In examining the history of epidemic catarrhs we find a very great diversity both in the symptoms and in the methods of cure; scarcely any two of them in immediate succession presenting a sameness of character. If nosological terms are to be continued in use, it is important that they should be applied with the utmost discrimination and strictest precision; otherwise unwary practitioners and others, seeing a method of treatment prescribed for a disease under the usual name by which it is known, will take it for their guide, right or wrong, and perhaps not discover their error until after the loss of several valuable lives. A great source of this want of precision in former times was doubtless the seldom recurrence of these epidemics, as according to Dr. Fothergill, they had appeared at uncertain intervals in England during the two hundred and fifty years last preceding the year 1764, on an average of only once in thirty one-years; but unfortunately for us in modern times this excuse does not apply, for since the year 1768, they

have returned in England upon an average of once in only about every six years, and in this country since the year 1757 the average has been once in only about every seven years. It prevailed in America in the years 1757, '61, '72, '81, '89, '90, 1807 and '16, so that in this ratio it may return under the observation of one man, during an ordinary lifetime, six or eight times, which affords but too ample an opportunity to industry and attentive remark to make accurate observations and usefu distinctions.

Dr. Rush remarks that "the influenza passes with the utmost rapidity through a country, and affects the greatest number of people, in a given time, of any disease in the world;" in which he is corroborated by many other writers. But our late epidemic was peculiarly slow in its progress in pervading the country. In its march from the northward to the southward its progress appears to have been only from about one hundred to two hundred and fifty miles per annum. In the winter of 1813 it was in Philadelphia; in the winter of 1815 it had advanced as far southwardly as Salisbury, N. C. and in this winter it has visited most parts of South-Carolina. Since its invasion of this State, its progress from place to place has been equally peculiar; appearing in spots or neighbourhoods only thirty or forty miles distant from each other, at periods of four, five, six or eight weeks apart. It was also peculiarly capricious in the circumscribed locality of its prevalence, attacking one particular community, raging for eight or ten weeks, and then passing over a large intermediate tract of country and seizing on another circumscribed community. In this way it has been meandering through the State ever since early in last November, and at this time is still raging in some neighbourhoods adjacent to others where it prevailed early in the winter, and from which it had long since passed off.

It has been peculiar in raging with the greatest severity in the interior of the country, whilst the sea coast has been exempted or suffered comparatively but little. And yet in the interior of the state, the most swampy situations, margins of rivers and places most subject to the endemial autumnal bilious fevers, have suffered most severely from the epidemic.

It was likewise peculiar in its manifest predilection for male

subjects in preference to females. The proportion of females attacked did not perhaps exceed one tenth or one fifteenth part; but some few who were attacked seemed to have the disease equally as violent as the males. Children under four or five years of age were remarkably exempted, and amongst children above that age the males most generally suffered. It was not peculiarly fatal to the aged, nor to such as had a prior tendency to pulmonic affections, but on the contrary some very old people recovered who had the disease severely; and, indeed, it fell with its greatest severity and mortality on the robust, and on such as were in the prime of life.—Corpulent persons appeared to enjoy an exemption;—and it was thought that Europeans and the natives of the Eastern States were much more exempted than the natives of more southern latitudes. Females in a state of pregnancy were not more liable to abortion in this disease than in others of equal violence, which unhappily is not the case in epidemical catarrhs generally. To drunkards, as might have been expected, it was generally fatal.

This disease was peculiar in its universal tendency to determine on the chest, in the form of pneumonia. For although a small proportion of cases determined to the head, blood-vessels only, or throat, yet the tendency to the chest was so general as almost to warrant the denomination of an epidemic pleurisy or peripneumony rather than that of influenza. It may also be remarked that relapses were more seldom than in ordinary influenzas. It was peculiarly under the influence of temperature and humidity. Upon the recurrence of cold damp weather, of which we have had an unusual share this winter, the cases immediately multiplied, and those who had been previously ill never failed to become worse. It was perhaps from this circumstance that it proved in many places peculiarly fatal to negroes, as they were more exposed to the vicissitudes of the weather, and their lodgings generally cold and uncomfortable.—Exposure to the external atmosphere and cold seemed constantly to predispose to the disease, and hence, perhaps, is the reason why females, children and corpulent people were more exempted from it than others, as corpulence serves as a defence against the influence of cold.

In two anomalous cases in this town the local determination to the brain was so sudden and violent in two robust men

as to occasion convulsions, without any premonitory symptoms.—Both these cases proved fatal, one within 48 hours and the other within a few days. In a lad of 14 or 15 years of age, the disease was ushered in by a sudden attack of stupor. He was travelling on the road in company with some others and complained of nothing before he fell down in a state of insensibility. This case recovered. A pneumonic case occurred, of a typhus nature, accompanied with a cough in every respect resembling the hooping-cough, except that the matter of expectoration was uncommonly copious and purulent from the beginning. This is a recent case, and after a tedious illness seems likely to recover. In three pneumonic cases towards the period of the crisis the disease precipitated itself upon the extremities, producing an alarming state of phlegmonic inflammation, which terminated the constitutional disease by establishing copious suppurations. In two of these cases it fell upon the arms, and the inflammations and enormous swellings extended from the fingers to the shoulders. The suppurations took place around the elbow in both cases, forming extensive sinuses from which the discharge kept up for many weeks. These are both recovering, but threaten an anchylosis. The other case fell upon the leg, suppurated copiously and is doing well.

I was informed by the physicians of this place of three cases in which hæmorrhages from one or both ears occurred, in which the patients lost from ten to sixteen ounces of blood. One of these cases recovered. Three or four cases occurred in which the eruption of a rash on the 2d or 3d day, put an end to the disease; and in one it appeared as late as the 4th or 5th week, in conjunction with the other usual symptoms attending the crisis, and seemed to be beneficial.

Two pneumonic cases occurred in which uncommon copious bronchial or pulmonary secretions took place at a late stage of the disease, and after the condition of the patients had given hopes, for several days, of convalescence. This secretion occurred suddenly, and the matter of it was expectorated by an exhausting paroxysm of coughing. The quantity expectorated at one time was from about four ounces to two pounds, in the space of from fifteen minutes to two hours. In

one of these cases it recurred periodically with nice precision, at the same hour and almost at the same minute in every twenty-four hours, for four or five times.

The matter of this secretion had an intermediate appearance between pus and mucus, of a white colour with a taste not easily described, but more nearly resembling the taste of a raw egg than any thing else. This secretion was followed by evident and immediate relief to the chest. The respiration became more free, the lungs more easily expanded, the remaining pains and uneasiness about the chest were mitigated, and the convalescence was visibly more rapid.

These discharges gave an impression that they proceeded from the rupture of vomicæ or abscesses which had formed in the lungs. But that this opinion was erroneous is obvious from the following circumstances. The matter was obviously different from the matter of common abscesses, as an experienced eye would readily perceive. If, however, it had been real pus, yet this alone would fall very far short of being proof that it proceeded from an abscess; for it is a fact long since established that pus may be, and very often is formed from inflamed secreting surfaces, and the secreting surfaces of the bronchiæ most especially are liable to take on this kind of secretion. The expectoration of this matter was moreover regularly periodical after certain intervals. It continued at each period about the same length of time, and then gradually, but rather abruptly, ceased; after which not a single particle of it could be expectorated by any effort of coughing, either spontaneous or intentional, until the next regular period of its recurrence. Now it is obvious, that if this matter had proceeded from a ruptured abscess, however rapid and copious the first discharge might have been, yet a supply of more or less matter must have been constantly formed in it until the abscess was healed; and must necessarily have been brought up, from time to time, during the intervals, by coughing. To suppose the contrary, we must believe each discharge to have been the consequence of the rupture of a distinct abscess, and the more especially as each succeeding discharge and even the last, was equally as copious as the first; and then we must admit the preposterous conclusion that each abscess was instantly healed

upon being emptied. A conclusion, unfortunately for the subjects of pulmonary abscesses, contrary to all experience.

Upon the whole I conclude that these discharges were the effect of bronchial and pulmonary secretion; and that it was a mode of evacuation attending the protracted crisis of the disease, by which the lungs were unloaded of infarctions and possibly the whole system relieved of offending matter; for it ought to be remarked, that both these cases had long passed the usual period of termination of the disease without the usual symptoms of expectoration, &c. attending the crisis.

In very many pneumonic cases a pain remained on the seat of the inflammation during the whole time of convalescence. This pain, from the circumstances of its being so suddenly variable, sometimes better and sometimes worse in the course of a few minutes, and seldom giving any uneasiness except by an expansion of the thorax or some exertion of the muscles about the part, was most probably of a rheumatic nature. In one case they seemed to occupy every intercostal muscle, giving considerable pain upon every expansion of the chest, as by deep inspirations, &c. but occasioning little or none of uneasiness when these muscles were relaxed or only in their ordinary state of exertion. Although these pains were evidently seated in the intercostal muscles, yet there was an evident connection between them and the state of the lungs, insomuch that a few coughs and even small expectoration would occasion a mitigation of them for some time.

I have given the principal peculiarities and anomalies that have attracted my attention, and beg leave to close this communication with a notice of some popular notions with regard to the prevention of this formidable disease. I am informed that the inhabitants of Williamsburgh district, where it has made great ravages, believe that the progress of the disease has been completely stopped by burning their woods, and it is said that several circumstances afford considerable grounds for the opinion. I am also informed, that a gentleman in the town of Granby, where the mortality has been almost unparalleled, had an early recourse to burning tar in his yard and about his doors. His family escaped the disease. Another gentleman of Camden, whose negroes were situated on his plan-

tation not far from another where the negroes had experienced uncommon mortality, upon perceiving that the disease had made its appearance in one of his kitchens, had recourse to the same expedient and the disease progressed no farther. In Fairfield district a notion has prevailed, that those who were employed in clearing lands where great quantities of brush and wood have been necessarily burned, have been exempted from the disease. Is it impossible that these notions should have some foundation in truth? The products of the combustion of various kinds of vegetable matter may contain some active and potent agents. It is known to chemists that the combustion of several substances, and especially the resinous wood of pine, produces carburetted hydrogen gas in very great abundance. This gas, from its affinities with some other species of matter, is capable by combinations of totally changing their properties. Is it then impossible that this substance should combine with the latent remote cause of the epidemic in the atmosphere and destroy its virulence? Or is it impossible that carburetted hydrogen gas should so influence the animal system as to destroy its susceptibilities to the impressions of the remote cause? These ideas are altogether hypothetical, but perhaps not too absurd to demand some attention; nor to forbid a further enquiry into the effects of combustion in arresting or destroying this all-devouring monster.

JAMES DAVIS.

Columbia, S. C. April 5, 1816.

Extract of a letter from Dr. J. Trent, to Dr. E. S. Davis, of Abbeville, S. C.

Richmond, March 19, 1816.

Dear Sir—The epidemic of which you speak as raging with unexampled mortality in South Carolina, is most likely of the same kind with that which prevailed here the last winter. (1815.) You request me to give you a history of our epidemic, with the treatment which I found most successful. This cannot be fully done in the compass of a letter, as its aspect was influenced by a variety of circumstances. The disease attacked suddenly (when violent) with a chilliness or ague, excruci-

ating head-ache and pains in the joints, soreness of the throat, hoarseness and oppressed breathing. As soon as the head-ache moderated, the patient generally complained of pain in some part of the chest or abdomen, which was seldom fixed for the first two or three days. With the coming on of these shifting pains of the breast, the cough and respiration became more troublesome and laborious, and was often attended with a rattling or wheezing, which denoted great danger, as it proved the lungs to be threatened with congestion of blood or effusion of lymph, a morbid condition from which they are not easily relieved, and to prevent which our efforts should be promptly and vigorously made. In some the whole force of the disease was spent upon the head, producing a suffocated state of the brain, which carried off the patient in from 24 to 48 hours.—Others had it to fall upon the throat, producing cynanche laryngæa, which suffocated the patient in from 6 to 48 hours.—But the most common form of the disease was a congestion of the lungs, which in a few days ended in suffocation. The only lingering cases were those in which coagulating lymph was effused on the surface of the lungs and the brain, creating an irritation which kept up the fever for two or three weeks; but which were oftener and more easily removed in consequence of the time afforded for a salivation. The treatment of the epidemic was regulated by the type of the fever which attended; which in this place, in a large proportion of the cases, was inflammatory or mixed (synocha or synochus.) I saw not a case of typhus, and yet it was called typhus generally; but was made so by the stimulating practice which occasioned that prostration of the system consequent to a state of indirect debility. This word typhus has occasioned the death of thousands in our country within the last four years, by leading to an erroneous conception and treatment of the prevailing diseases. Practitioners should recollect that the most inflammatory diseases produce the most immediate and overwhelming prostration of strength.—The debility is of the indirect kind, and not typhoid as is generally supposed.

To relieve this debility you must abstract from the oppressed system in that gradual and cautious manner which a

knowledge of the subject or principle of reaction alone can teach.—I pursued the antiphlogistic course of practice throughout the fever. Bloodletting was used at the beginning according to the state of the pulse and the preceding health of the patient. In a majority of cases I did not bleed at all, and yet I bled in this disease more copiously than I had ever done before. From many whose brain or lungs were threatened with congestion, I took, with the most happy effect, from 25 to 50 ounces of blood at once, and sometimes repeated the detraction to nearly the same quantity, being regulated by the reaction of the system. The blood was cupped and sizy. An emetico-cathartic dose was then given and a large blister laid betwixt the shoulders, or around the throat if the disease located itself here. In violent cases I gave of ipecacuanha and calomel each, 20 grs. mixed, or a dose of salts with 3 or 4 grs. of tartarized antimony. This remedy operating well, produced unspeakable relief to the head and throat as well as to the breathing.

After bloodletting, vomiting and purging had been sufficiently used, I prescribed febrifuge powders or pills in which calomel always made a part. If the extremities or surface became cool, which was often the case, sinapisms or blisters were laid to the wrists or ancles, and the skin was bathed with hot spirit of turpentine.—Nothing was omitted to recal action or heat to the surface. This condition of the system was generally attended with a small, accelerated and corded pulse at the beginning. I always bled in it, which gave my patient a good pulse and equalized his excitement. A cold skin and small contracted pulse, were generally treated by potations of warm brandy or wine, which powerfully aided the disease in disorganizing the brain, throat or lungs. After the fever and its alarming attendants, inflammation, congestion and effusion, were removed by the antiphlogistic practice, I prescribed blisters, exercise and a restrictive diet to restore the patient.

I ought to have mentioned when describing the disease that a highly bilious character sometimes attended it. The patient not only throwing off a great deal of vitiated bile, but becoming very yellow. The liver was sometimes the part on

which the disease spent its force. A very frequent form of the disease was that of bilious pleurisy, which required less bleeding and more purging than the other form.

I am respectfully, &c.

JOS. TRENT.

On Cancerous Uterus.

[From the London Medical and Physical Journal, for October, 1816.]

In our last number, we expressed a wish of arresting the attention of our readers to the bold operation proposed, and, as far as we can candidly conclude, successfully attempted by Professor Osiander. Our particular intention was, that the disease usually called Cancer Uteri should be properly distinguished from the true Cancer of the Breast; because, for the latter, we are free to acknowledge that we have found the operation so frequently fail as to render us very cautious in recommending it.

It appears, that so long ago as the days of Aretæus, that valuable writer made a distinction between the malignant ulcer of the uterus and true carcinoma.* Among the moderns the distinction was lost, till Mr. Hunter revived it. As this was not done in any of his published works, we shall take the liberty of tracing the progress of the enquiry as far as it has appeared in print. We are the more induced to do this, because the first edition of "Adams on Morbid Poisons" is now rarely met with, and the passage to which we refer, is neither contained in the second edition, nor in his treatise on the Cancerous Breast. The following is the introductory part.

"There is only one other cancer with which I shall detain the reader, which, from its frequency and constant fatality, may well arrest a medical writer in his career. Of all the calamities to which a sex that seems destined to support the

* De causis & sedib. Morb. Diuturn. lib. 2, cap. 11, p. 64. Edit. Lugduni Batav. 1735.

largest share of human misery is obnoxious, the cancerous uterus is the heaviest. This will not, I apprehend, be disputed; whether we consider the situation of the disease, almost any one of its attendant symptoms, or the certainty of a life more wretchedly protracted than by any means that the ingenuity of Indian torments can boast. We are ready enough to call the gout *opprobrium medicorum*, because we know, in most instances, it may be called *opprobrium divitiarum*. But what shall we say of a disease that is every day occurring, and the medical progress of which has hitherto extended no further than to confound it with another, which it only resembles in being painful and incurable; and to apply remedies which have derived their reputation from curing diseases different from either! The latter part of this proposition is, I trust, already proved. If the former rested on my own authority, I might have only ventured to ask, where are the cists, where the fungus, where the increased size, in the most common of all the cases of cancerous uterus. I might ask, do we discover more than a sloughing phagedænic ulcer, with thickened hard lips, which slowly destroys the organ and all the neighbouring parts, till *the kindest of physicians* puts a period to the disease and the patient's sufferings.

"That true carcinoma may attack the uterus as well as any other part, is a position I shall not attempt to deny; but that the above, the most common species of what is called cancerous uterus is improperly confounded with the disease in the the breast, is a remark for which I was first indebted to Mr. Hunter. A writer,* whom he could only know by name, but with whose works every physician practising in London must be well acquainted, takes some pains to correct this error, which existed in his time; and Morgagni describes two cases, in one of which this ulcer had committed its usual ravages on the cervix, in the other it had extended to the neighbouring parts, while the rest of the uterus was sound.†

But neither Hunter, Aretæus, or Morgagni, is any authority for a plain matter of fact, on which any one may satisfy

"* Aretæus, cap. xi.

"† De Causis & Sedibus Morborum, Epist. xlvii. 8, & xxxix. 33.

himself. It must, therefore, depend on the observations of those who have the best opportunities of seeing such appearances. From the general accuracy of Dr. Baillie's descriptions, and from the universality of his enquiries, we might expect a solution of this important difficulty; but his account of the diseases of this important viscus is much too short and confused. If the section of the cancerous uterus does sometimes exhibit an appearance similar to other parts in what is called a scirrhous state, this is neither a necessary nor the most common attendant on the sloughing phagedæna of the cervix and neighbouring parts. I had an opportunity of inspecting in one winter the uteri of four women, who died of the complaint, and none of them exhibited the least appearance of disease a quarter of an inch beyond the ulcer. None of them appeared enlarged, nor was there any 'whitish firm substance, intersected by strong membranous divisions.' In the melancholy collection preserved by Dr. Lowder, few appear enlarged, and of these very few beyond the size that this uncertain viscus often exhibits in a sound state."*

This work was published soon after Dr. Baillie's first edition of "Morbid Anatomy." In all the subsequent editions, Dr. B., with a candour which has distinguished his character through life, altered the passage, and added the following note to his alterations.

"This diseased change I formerly confounded with the scirrhous enlargement of the uterus, considering them as varieties of the same disease, and therefore blending their description together; but, in consequence of the accurate observations of Dr. Adams, in his Essay upon Morbid Poisons, I have thought it proper to separate them."

Mr. Clarke, whose work we noticed in a late Number of our Journal, has renewed the subject with equal judgment and modesty.—See London Medical and Physical Journal, page 337, vol. xxxiii.

Having premised thus much, we conceive we have prepared our readers for one of the boldest operations that has been suggested in this age of chirurgical improvement.

* Adams on Morbid Poisons, first edit. page 177.

"*Observations on the Cure of Cancer of the Womb by Excision.* By F. Bj. Osiander, Professor of Midwifery in the University of Gottingen.*

"Cancer of the womb is one of the most dreadful evils which can afflict the female sex. More frequent in many places than is commonly believed, it commits greater devastations in an insidious but malignant manner, and does more harm than many other diseases,—and has seldom yielded to any external or internal remedies hitherto used.

"The superintendance for many years of the Royal Clinical Hospital of Gottingen having given Professor Osiander frequent opportunities of examining and treating persons suffering under this disease, he, with the active assistance of the young physicians and surgeons who frequented his *clinicum*, employed, in many such cases, all the means, external and internal, which were known or imagined, in order to ascertain by what means, or by what mode of treatment, a stop could be put to the progress of this terrible disease; but he learned from experience the melancholy fact, that little else could be done with it than, in a few cases, to retard its progress, and render the sufferings of the patient more supportable; that is to say the pain, the bleeding, and the bad smell;—to effect a cure seemed absolutely impossible. Long before he attempted any operation with the view of curing this disease, he conceived it might be possible to cure cancer of the womb by excision, in the way that has been long known and practised in the case of cancerous mammæ. The possibility of the success of this operation, he founded on the repeated and well known observation, that the inverted and prolapsed uterus has been sometimes cut off designedly by surgeons, and by midwives through ignorance, and yet the persons survived its excision. A woman still lives in the neighbourhood of Gottingen, from whom, twenty-six years ago, an old ignorant midwife cut, or rather sawed

"* This paper was communicated by John Thomson, M. D. Professor of Military Surgery in the University of Edinburgh, at the request of the author. It was published in the Gottingische gelehrte Anzeigen so long ago as the 13th of August 1808; but, when the subject is important, and the information new, the date of a communication is of no consequence, except as a historical fact.—*Editor*" [of the Edin. Journal.]

off, with a bread knife, the uterus inverted and prolapsed after delivery. The late Professor Wrisberg at that time read the history of this woman before the Royal Society; and it is to be found in this Journal (Götting. gelehrte Anzeigen) for 1787, No. 81, p. 810. It likewise appeared in the eighth volume of the Commentat. Gotting.

"These observations induced Professor Osiander to propose, fifteen years ago, in his lectures on the diseases of women, the bold measure of curing cancer of the uterus by extirpation; and he suggested various methods of doing so; among others, the very same which the late Dr. Struve, one of his former pupils, and physician in Prenzlau, afterwards published as his own invention, in the third number of the sixteenth volume of Hufeland's Journal for Practical Medicine, in the year 1803, and against which Professor Osiander cautioned the public at the time. Professor Osiander, however, found the performance of this operation to be very different from what he had conceived, when, at last, on the 5th of May 1801, an opportunity offered itself to perform it. The patient was a widow, whose situation was indeed as deplorable as could be imagined. The vagina was distended by a carcinomatous fungus of the orifice of the womb, as large as a child's head. It was extremely fetid, and bled very violently. The fungus was seized and brought low down in the vagina by means of Smellie's forceps; but, in endeavouring to put a loop round the neck of the womb, the fungus broke off, and the bleeding was terrible. The young physicians and surgeons, and a few experienced physicians who were present, among whom Professor Osiander quotes as a witness Dr. Althof, physician to the Elector of Saxony, advised him to give up the operation, because they believed the woman would not be able to undergo it, after losing so much blood. But the patient herself begged that the operation once begun should be completed, and encouraged the professor to continue it, to the great surprise of all who were present. As there was no longer any of the neck of the womb hanging down in the vagina, by which the uterus could be drawn down, necessity, the mother of many inventions, suggested to Professor Osiander the idea of pulling down the uterus by passing threads through it with a needle, and

securing it in this manner till the operation was finished. Crooked needles were immediately mounted with fine waxed packthread, and carried with great caution to the bottom of the vagina, pushed through it and through the body of the womb, and then brought out through the inner orifice of the uterus; for the neck of the womb and its external mouth were already destroyed by the cancerous fungus. In this way four threads, one from each side, from before, from behind, and from both sides, were brought through, by which the uterus was gently drawn low down into the vagina, and kept fast as soon as it was near the external orifice. Professor Osiander then introduced a strong Pott's bistoury under the fore-finger of the right hand, and cut horizontally through the womb above the scirrhous part, as straight as if it were divided out of the body, where he could see it. The part that was cut off, preserved in spirits of wine, along with many other products of similar operations, was exhibited to the Royal Society. The bleeding for an instant was violent, but was very soon stopt by a sponge saturated with a powder made of equal parts of alum, gum Arabic, and colophony, applied in the vagina. After the bleeding had ceased, sponges dipt in a solution of sacchar. saturni and vinegar, were applied to mitigate the inflammation, and as soon as matter was perceived on the sponge, suppurants were employed. Professor Osiander for this purpose made use of a mixture of the extract of unripe walnut-shells, with honey, and red precipitate, which was introduced on sponges with great caution, so that the anterior part of the vagina was scarcely touched by it. When the discharge is very copious, the quantity of the mixture must be reduced, and the red precipitate omitted; if inconsiderable, its quantity must be increased. The cure of this first operation went on so rapidly by the assistance of tonics, particularly cinchona, internally, that the patient could leave her bed in the third week, and in the fourth walked about, totally recovered.

"The success of this first operation gave Professor Osiander the courage to undertake it again soon afterwards; and he has now performed it nine times, and always with similar success. Even one of those patients, after enjoying good health for three years, came to him to be operated upon a second time,

for the cancer broke out again, and he performed it with the same success as before. He reserves for a future occasion the circumstantial relation of each case, and at present only gives the following result of the observations, which he had so many opportunities of making with regard to this disease, and others which are frequently mistaken for it.

"The scirrhus and cancer of the womb begin almost always on the external orifice of the uterus, and proceed from thence to its body; and often before the disease has destroyed half of the womb, death puts an end to the agonies of the sufferer. In rare cases, an ulcer is formed in the bottom of the womb, which degenerates into a cancer that admits of no cure. But, in the first case, a perfect cure may be obtained by cutting out in time the scirrhous and cancerous portions. When the cancer spreads from the orifice of the womb down into the vagina, which it very often does, no cure is to be expected from excision.

"True scirrhus and cancer are, however, very often mistaken for other diseases.

"First, for the benignant swelling and thickening of the womb, which often happens after abortions, miscarriage, or difficult natural labours. The neck of the womb and its orifice swell to twice their natural thickness. The weight and pressure of the whole womb becomes disagreeable to the woman, and causes a sensation as if it would fall out of the body. This swelling is caused by accumulation of blood in and about the womb, from *plethora localis;* and being for the most part joined with hæmorrhoidal symptoms, and indeed oftener with hæmorrhoids in the vagina, physicians and others, even accoucheurs skilled in investigation, are frequently misled, and conceive it to be a bleeding cancer of the womb. This swelling (εξογκωσις) and thickening (σκληρωμα) of the womb may remain during life without becoming malignant, when no other cause comes into operation. It may be cured by remedies which take away the *plethora localis;* but it may also degenerate into a true scirrhus and cancer, when local irritation or morbid matter, *e. g.* a chronic exanthema, repelled from the skin to the womb, supports and augments the swelling.

"Professor Osiander had repeated opportunities of treating

such cases, which, as well as their causes, are frequently misunderstood. In some instances, a round hard pessary, introduced with force, so squeezed and pressed the neck of the womb, as to cause an obstinate scleroma, which could only be cured by an operation. In one case, cancer of the womb, lameness of the lower extremities, and miserable death, were the consequences of a pessary forgotten in the vagina, and pressing on the mouth of the womb.

"Another cause of scleroma, and several symptoms resembling cancer of the womb, which is often misunderstood, is the incarceration of a retroverted unimpregnated womb. The fold behind the womb is in many women of such a form, that it is very narrow above, and wide below, nay, even sometimes divided into two parts by a perpendicular partition. After labour, and by hard straining to have a stool, the bottom of the womb is sometimes pressed backwards and downwards into this fold, and cannot recover itself again; the womb begins to swell, and causes a great pressure on the anus, irritation on the bladder, and violent hæmorrhoidal symptoms. Professor Osiander met with four cases of this kind, three of which he treated with success, instructed by the first.

"In the first case, a widow complained of constant hæmorrhoidal symptoms, a disagreeable pressure on the anus, and frequent faintings. The seat of pain was not examined, but external and internal remedies for the hæmorrhoids were administered. She was suddenly attacked by nervous fever, and died. On opening the body, the unimpregnated womb was found retroverted, and adhering to the bottom of the fold. Behind this a wide spreading ulcer was discovered, with traces of inflammation on the intestines and spleen. The ovaria were indurated.

"In a second case, after abortion, the hæmorrhoidal symptoms continued a long time, and caused excruciating pain, and most obstinate costiveness. On examination, the womb was found retroverted and incarcerated, with a sarcoma on its outer and anterior side, of the size of a very large chesnut. As it was impossible to bring it back by the common taxis with the point of the finger, Professor Osiander contrived a peculiar manner of operating, which, in this, as well as in the

two following cases, gave speedy relief. He introduced his dilator from above to the bottom of the retroverted uterus, and turned the instrument round at once. By this method the bottom of the womb started up suddenly. In another case, the womb, together with a polypus as big as a pear, had been retroverted upwards of a year, and had caused effects like those of pregnancy, hæmorrhoidal affections, and symptoms resembling cancer. Professor Osiander recognized the disease at the first examination; raised up the womb as in the former case; and, after a few days, he dilated the uterus with the same instruments, and cut the polypus out by the root, with crooked-bladed scissars of his own invention, which he is in the habit of doing with all polypi, for he never either ties or tears them out. In the last case, the womb was retroverted for some years, and had caused the severest hæmorrhoidal affections, as well as difficulty in passing urine, and going to stool. These symptoms were aggravated by the many warm injections that were applied *in ano* and *in vagina*, the affection being mistaken by the physicians for a cancer of the womb. But Professor Osiander, on the first examination, discovered the real nature of the disease, and, by the skilful application of his dilator soon put an end to the long existing cause.

"Secondly, Cancer of the womb is often confounded with ulcerated polypus of the womb discharging fetid ichor, and with sarcoma of the uterus. These constitute a peculiar, and not very uncommon disease of the female sex, generally misunderstood, and frequently left as incurable; but Professor Osiander, for some years past, has cut out and cured many, after a peculiar and successful method of his own, and his method of treatment, and his observations on it, will be laid before the public on some future occasion.

"The causes of cancer of the womb are manifold. One very common cause, besides mechanical injury of the external orifice of the womb, is syphilis, obvious or latent, or a scrofulous, herpetic, atrabilious and gouty disposition. Besides, all eruptions of the skin fall readily on the private parts of women, in consequence of a continual local irritation, and cause fluor albus of various kinds, which sometimes precedes cancer of the womb, and sometimes accompanies it.

"Among the internal remedies used in the cure of cancer of the womb, along with the operation, Professor Osiander found none so powerful as mercurials with antimonials, and the free use of diuretic drinks. He has not hitherto ventured to make trial of arsenic, although he believes, that, in doubtful cases, it might be cautiously used; but he has not as yet met with a proper opportunity, which occurs oftener in hospitals than in private practice. Professor Osiander admits only now and then into the lying-in-hospital, of which he is the director, a patient afflicted with cancer of the womb, where there is some hope of her being cured; and last year, he again relieved such a patient from her long sufferings, by operating upon her in the presence of many of his pupils. He never made a secret of his manner of operating, although he has been publicly upbraided for having done so; nay, never was such an operation undertaken without stangers as witnesses. He has taught it every year in his lectures, and often performed it publicly before his pupils. He communicated it to every physician in his own country or abroad, who wrote or spoke to him on the subject. Last year he sent an account of the operation to Mr. Maunoir, senior, of Geneva, in a letter, written in the Latin tongue, which Mr. Maunoir communicated to Mr. Martin, surgeon to the hospital in Lyons, and to the medical faculty of Montpellier. This letter, along with Mr. Maunoir's theory of cancer, was printed in the Annals of the Medical Society of Montpellier. Even very lately Professor Osiander performed the operation in Switzerland, in the presence of three skilful physicians and surgeons. What may be its ultimate success is not yet (1808) known, but hitherto the accounts are very favourable.

"Professor Osiander has two methods of operating for cancer of the womb:

"First, in the manner already described. The patient must be placed on a high labour-stool, or on a table, in the position for the operation for the stone, or for delivery, and held fast. The private parts are cleaned out by injections, and softened with an ointment. The fungus is taken away with the finger, or with an instrument. If the bleeding is great, it will be stopped by applying a sponge dipped in vinegar with astringent

powder; if not, the operation is immediately continued. For piercing the uterus, Professor Osiander uses small crooked needles made of soft steel, so that their points can be easily bent. Hard tempered needles are in danger of being broken, and if the broken points be not found, they might do the greatest harm. The greatest difficulty is, to bring the needles through the uterus, till by practice the necessary dexterity is acquired; but the length to which this can be carried, the following circumstance will show. Last year, in the lying-in-hospital here, it happened, in a public operation, that the threads were drawn out of the needles, after they had been pushed through the uterus. Professor Osiander left the needles in the uterus, and threaded them again within the vagina, without requiring the assistance of a contrivance for throwing in light. The operator can and must, in such a case, acquire by practice the same precision and dexterity which many blind people have, as he must act as a blind man. A needle-holder is used merely to introduce the needles; the pushing of them through, as well as all the rest of the operation, must be performed by the fingers alone. The direction of the stitches is from behind forwards, also from before backwards, and from the sides to the centre. The greatest caution is necessary, that the needles do not go too far, and catch upon the vagina, or puncture one of the arteries, or the great veins behind the coat of the vagina. To prevent this, the operator must sacrifice his fingers; and the point of the needle, when through, must be bent immediately with the point of the finger, and seized, and drawn through with a pair of forceps. This cannot be done without pricking the fingers; and it might have been thought that the fingers could not escape being dangerously infected, having to work so long afterwards in the morbid ichor. Professor Osiander, however, was never infected; for, immediately after the operation, he always washes his hands repeatedly with soap, and then washes out the pricked wounds with diluted sal volatile, and last of all sucks them out, without applying any suppurants to the wounds. After five or six days, the wounds healed without any inconvenience.

"A waxed thread four times doubled must be drawn through each needle; very often two of these will suffice to

draw down the uterus into the vagina; at other times, four are required.

"Many physicians have an erroneous idea of this operation; they believe that the uterus must be drawn out before the body, that is to say, must be brought out entirely. It is equally erroneous to suppose that it is intended that the whole uterus should be cut out, and for this reason the operation for cancer of the womb is denied by some or rejected as impossible.

"By the threads the whole womb is only fixed in the bottom of the vagina to be cut off, but the drawing of it down is sometimes rendered difficult, from an adhesion of the external mouth of the womb to the omentum. Upon a late occasion, from this cause, the uterus could not be drawn by the threads, and the threads were accidentally cut in introducing the bistoury. Professor Osiander took a pair of lithotomy forceps, laid hold of the orifice of the womb with them, and cut the cervix off.

"The cancerous and scirrhous portion is to be cut off only as far as the healthy substance, which is known by feeling the smooth surface, and elastic firmness of the latter, which are very different from the rough and woody-like scirrhus.

"The crooked bistoury must be small, strong, and sharp, and rounded at the point. It is to be carried up close to the cervix, as high as possible, while an assistant keeps the labia separated. The incision must be made in curve lines, first boldly, and then cautiously, for fear of hurting the vagina. This is Professor Osiander's first and oldest method of operating.

"The second is as follows: When the cervix is already for the most part destroyed by the cancerous fungus, much enlarged, and the cavity full of knotty carcinomatous fungus, and it is neither possible to lay hold of the uterus with the needles, nor draw it down, then he places the patient almost in a horizontal position; makes an assistant lay his hand on the region of the *fundus uteri*, to press down the womb; fixes the bottom of the womb in the hollow of the os sacrum with the forefinger of the left hand; introduces the middle and ring-finger into the womb, and, with the help of these fingers to guide the cut of the scissars, he extirpates, in small pieces, all the fungous, rough, and scirrhous parts, with a pair of bent-bladed

scissars, and an instrument of his own invention. As soon as this is done, he fills up the cavity with a sponge dipped in wine, and in the astringent powder spoken of before, and treats the wound in the manner already mentioned.

"According to the testimony of all those who have submitted to it, this operation is not nearly so painful as one might imagine, and it heals much sooner than could be expected. Nature seems in no part of the human body to be more active in reproducing what is lost, and in healing what is wounded, than in the parts of generation in both sexes. It is surprising to see (for example) a scrotum lost by mortification, restored again in four weeks. It is no less surprising, for a kind of mouth of the womb to be regenerated in a few weeks after the *cervix uteri* has been totally cut off; or regular menstruation to be re-established equally soon from the half womb left after the operation.

"The duration of the cure is very different, as it is in every operation for cancer. One circumstance, and the result of experience, is of great importance, namely, that neither during the operation, which is conducted with so great difficulty, nor during the subsequent treatment, has one patient hitherto died. Some of them died more than a year afterwards from other causes, as from apoplexia nervosa, dropsy, and the like, or the disease returned suddenly again from new causes, and became incurable; others continued three years and more in good health.

"The sooner a patient resolves to submit to the operation, the longer will she enjoy her recovery; and the better she observes the diet that is prescribed afterwards, the better chance will she have of being freed from the evil for ever.

"It is consolatory to observe, that, in a disease which has been thought incurable, more has been done than was formerly thought possible, and that thus a new path is opened for the art of surgery, by which suffering humanity may derive help and comfort. Let, then, practitioners labour to acquire the courage and dexterity which is required to undertake such an operation, and conduct it to a fortunate termination."

Remarks by the Editor of the London Journal.—We have long suspected these diseases to arise from mere inflamma-

tion: first, because they are more common at that period of life when inflammation in different organs affects the sex, unless prevented by occasional hæmorrhage from the uterus, or by venesection; next, because at whatever age they may occur, a violent paroxysm or pain frequently precedes, and is relieved by hæmorrhage. This relief by uterine hæmorrhage is not confined to inflammation in that organ; it often attends the eruptive fever in the exanthemata, and, there is reason to believe, in many other fevers, though it is too often overlooked or confounded with the periodical discharge, or even considered as a diseased symptom; yet the relief derived from it after parturition, which is now well understood to be attended with inflammation, might induce us to think otherwise.

If inflammation in the uterus continues long, and exceeds certain bounds, we cannot wonder that suppuration or ulceration follows. The nature of the ulceration may be imputed to the structure and secretory property of the uterus, which may differ from other parts under suppuration, as we know its texture is different, and as we see a difference in the sequela of inflammation in various parts according to their structure. But, what has most confirmed our opinion, that the whole depends on inflammation is, that for some years past we have found dreadful pains in the loins and in the whole uterine region, with frequent hæmorrhage, often too at a suspicious period of life, which we apprehended might end in malignant ulcer of the uterus, always relieved by very free and very frequent cupping near the sacrum. Whether these cases would have proved ultimately the disease they were apprehended to threaten, it is impossible to determine, but this we can assert, that all the malignant ulcers, whose history we have been able to trace, have commenced with these symptoms, some of which have continued for years before ulceration. We cannot, therefore, scruple to recommend that practice in the early stage of these complaints; in the more advanced, we submit to our readers the prospect of relief held out by Professor Osiander.

Cases and Observations, illustrating the Influence of the Nervous System in regulating Animal heat. By Henry Earle, Esq. Assistant Surgeon to St. Bartholomew's Hospital, and Surgeon to the Foundling Hospital.

[From the Medico-Chirurgical Transactions. Vol. VII.]

Previous to the interesting experiments published by Mr. Brodie, in the Philosophical Transactions for 1811, it was a generally received opinion, that animal temperature depended on the chemical changes which the blood undergoes in the round of circulation. On this supposition a beautiful and apparently satisfactory theory had been constructed. This much esteemed fabric of human reasoning has, however, received a severe shock from the experiments above alluded to, which tend to establish the following facts: that when the brain has been destroyed, animal heat ceases to be generated, notwithstanding the functions of respiration are artificially continued, and apparently all the chemical changes are produced in the lungs; and further, that an animal thus subjected to artificial respiration, cools more rapidly than one that is simply killed by decapitation, probably in consequence of the circulating blood being exposed to the cold stream of air which is introduced into the lungs. From these facts it appears that nervous influence is essential to the production of animal heat.

Having met with some cases of impaired nervous energy which exhibited phænomena, powerfully illustrative of the above position, I have ventured to submit them to the notice of this Society, conceiving that a strict attention to the alterations in the natural functions, produced by accident or disease, must be considered as one of the least fallacious means by which we may hope to arrive at success in our physiological inquiries. In the present instance, the results arising from comparative experiments on animals, and those drawn from pathological observations, most happily correspond; but although they equally tend to prove the importance of the nervous system in regulating the temperature, we must not lose sight of the action of the circulation on the brain and nerves.

In the second part of this paper I shall offer some further observations on this subject, and illustrate it with instances of increased nervous energy, which, together with the first set of cases, will tend to throw some light towards elucidating an obscure but beautiful function in the animal economy; whilst at the same time they will enable us, without much difficulty, to reconcile the discrepancies which appear to exist between the former theory of animal heat, and more recent discoveries.

Should the observations I have made, and the conclusions I have drawn, be deemed erroneous and untenable, I trust the facts at least will be sufficiently important to merit attention.

Case I.

Thomas Anderson, a mariner, in the month of February, 1812, fell from the main yard into a boat alongside of the ship; he was stunned with the fall, and remained insensible for a considerable time. On recovering, he found that the surgeon had bound up his left arm, in consequence of a fracture of the collar-bone. After six days the bandages were removed, and the limb was found useless and paralysed. For about three weeks after the accident, on any attempt to move the limb, and at times when perfectly quiet, he felt violent pain, which he referred to the extremity of the fingers; but as they and the whole arm were perfectly insensible to any impressions, it is probable that the pain was excited where the nerves were injured under the clavicle, and that the percipient mind referred it to the extremities, as is frequently the case after amputation.

This painful stage gradually abated, and the arm remained perfectly palsied and useless. In this state he applied to me, about the end of August. From the history of the case it appeared most probable, that the same blow which had fractured the clavicle, had lacerated or crushed the axillary plexus of nerves just as they pass under that bone. The circulation of blood did not appear to have suffered, the pulse at the wrist being synchronous, and equally strong with that of the other limb; yet the temperature was greatly below that of the healthy extremity. As he had never tried electricity, I determined to resort to it, conceiving that it might possibly have

a beneficial effect in restoring sensibility. On examining the heat of the limbs previous to the use of electricity, I found it as follows. Left or paralytic hand 70°; bend of the arm 85°; axilla 94°. After drawing strong sparks for about ten minutes, the heat of the hand was increased to 74°; bend of the arm to 88°; axilla to 95°. The temperature of the other hand was 92°.

After using electricity for some days, he said that he felt a degree of warmth and tingling which remained for a considerable time after its administration. In ten days I repeated the experiment in a more accurate manner, after placing him on an insulated stool. The temperature at this time was:

		Before Electricity.	After Electricity.
Paralysed limb.	Hand	71	77
	Arm	80	83½
	Axilla	92	93
Healthy limb.	Hand	92	92
	Arm	95	95½
	Axilla	96	96

After some time, sensation began to return in the integuments about the shoulder and inside of the upper arm; and the muscles of the scapula and great pectoral muscle began to recover their power. It was curious to observe this gradual return of sensibility; one part of the arm possessing natural feeling, another being morbidly sensible, and immediately beyond being quite insensible to every mechanical or chemical injury.

Being desirous of ascertaining if other stimuli acted as powerfully, or if the increased heat depended on any peculiar action of electricity, I determined to apply a blister to the back of the hand. I was obliged to repeat it several times before it would act; at last however a vesication was produced. During the time that the blister was acting, there was no alteration in the thermometer placed immediately contiguous to the edge of the plaster; but on removing the bladder and applying the bulb to the denuded cutis, a rise of three degrees took place. Whether this depended on the stimulus of the blister, or on the removal of the cuticle by which a more inter-

nal part was exposed, I am not able to determine. The blistered surface was not in the least sensible to any injuries, and healed very readily. A short time after this, I recommended him to place his arm in a tub of warm grains, having previously ascertained with his other arm that they were not too hot. I was induced to recommend this remedy, from an idea that the returning sensibility might be aided by raising the temperature to its natural standard, by artificial means. He retained the arm in the pail for nearly half an hour, and on withdrawing it found the whole hand blistered in a most alarming manner, and at the extremities of his fingers and underneath the nails sloughs had formed. He said that he did not at the time feel the grains at all warm, nor did he experience the least pain. A considerable degree of inflammation spread up the absorbents, and matter formed in the axilla, which was soon absorbed and the inflammation assuaged. The temperature of the ulcerated surface of the hand varied from 80° to 86°, but from the constant application of warm fomentations and poultices, no very accurate result could be obtained, as the limb was at all times liable to partake of the degree of heat of surrounding bodies. At the time when the sores were worse, he experienced a heavy aching sensation in the hand, which was not aggravated by any external injuries.

The progress of the case from this time was slow, but it continued to advance towards a perfect cure. He quitted my care soon after the ulcers were healed, and went on board a ship to act as cook, and I have not since seen or heard from him. When I last examined the limb, the shoulder and upper arm had regained their sensation and power; the integuments in front of the fore-arm were very tender when pressed. The skin on the back of the arm was less sore to the touch. His hand was still insensible, but he felt a consciousness of returning muscular power, and more than once thought that the flexor muscles did contract involuntarily. The temperature of the whole limb was sensibly increased, but the hand was still liable to be affected by the surrounding medium.

On reviewing the circumstances of this case, it appears, that a limb deprived of due nervous influence is of a much lower temperature than natural, notwithstanding there is no apparent

diminution in the circulation of the blood. That a limb so circumstanced is incapable of supporting any fixed temperature, and is peculiarly liable to partake of the heat of surrounding media; and lastly, that it cannot, without injury, sustain a degree of warmth which would not be at all prejudicial to a healthy limb.

Case II.

Maria May, aged 14, applied to me in the year 1807, in consequence of a painful affection of the inside of the fore-arm and hand, extending to the extremity of the little finger. She was unable to account for the origin of the complaint, and said that it had been gradually increasing for some months. At the time of consulting me, the whole course of the ulnar nerve from the elbow downwards, was morbidly sensible when touched; the mere drawing on a glove would sometime cause so much pain as to make her scream and fall to the ground. The pain at times occurred spontaneously, without any apparent exciting cause. The integuments on the inside of the fore-arm near the elbow were hotter and fuller than natural. The pain deprived her of rest at night, and her general health was greatly disordered.

She remained under my care for above three years, occasionally suffering extreme torture; at other times being comparatively easy. During this long period a great variety of constitutional and topical remedies were resorted to in vain. During any severe paroxysm she always experienced most relief from the application of leeches and cold evaporating poultices. In December, 1810, she was so much worse that I was induced to propose an operation, as the only probable means of affording any permanent benefit. I was well aware how frequently the operation had failed of curing the *tic douloureux* of the face, but was induced to look for a more favourable termination in the present instance, from the nervous communications being less numerous, and from the greater length of the nerve, which would enable me to make a division above the diseased part. Having fairly explained the possibility of the disease returning, she readily submitted to the proposed operation, with the prospect of obtaining temporary

alleviation from her sufferings. Mr. Langstaff favoured me with his assistance at the operation. I made an incision of about two inches in length, beginning immediately behind the internal condyle of the humerus, and carrying it upwards in the course of the nerve. In making this wound, I exposed a considerable cutaneous branch, which I was afterwards induced to divide, in consequence of the morbid sensibility of the integuments it supplied. Having laid bare about an inch and a half of the nerve, an incision was made through it, at the part nearest the brain; the pain produced was very acute, and felt, to use the girl's own expression, like a violent electrical shock. It was however the last she had to suffer; the little finger and one half of the ring-finger from that moment lost all sensation, and the integuments on the inside of the hand became perfectly void of feeling. Rather more than an inch of the nerve was dissected out as low down as where it passes behind the internal condyle. The neurilema covering the nerve appeared firmer and thicker than natural.

Her health mended rapidly, after this source of irritation was removed; she lost all her nervous sensations; the wound healed readily, and in about three weeks from the operation she was perfectly well. All the parts supplied by the ulnar nerve had lost their sensibility, and the little finger remained in a paralysed useless state.

A short time after, during severe frosty weather, she called on me in consequence of a blister having formed on the little finger, at the extremity of which, and under the nail, there was a slough. She was unable to account for this, unless from the severity of the weather; that finger being at all times much colder than any other part of the body. By keeping it constantly wrapped up in a warm linseed poultice, it soon healed.

Three several times after this she applied to me with a similar affection, arising apparently from sudden alternations of temperature, as the weather continued cold, and she was obliged to wash dishes in warm water of a temperature not at all unpleasant to the rest of the hand. I regret that I did not then accurately ascertain the comparative heat of the finger and the rest of the hand; but at that time my attention was not alive

to the subject, and I contented myself with noting down the phænomenon*.

From the circumstances of this case I conceive it admissible to conclude, that the want of power of supporting such variations of temperature as were perfectly harmless to the rest of the hand, was dependent on the want of nervous energy; as this was the only apparent deviation from a healthy natural state.

This opinion is greatly strengthened by reading a highly interesting case of impaired nervous energy, accompanied with a loss of power of regulating the animal temperature, which was published by Dr. Yelloly in the Third Volume of the Transactions of this Society, to which I must refer for any further particulars.

As a further illustration of deficient nervous power, accompanied with a loss of temperature, I may mention, that in examining paralytic limbs I have invariably found them colder than any other part of the body, unless they have been kept artificially warm. Some time since a friend examined twenty-five cases in the Bath Hospital, and found the paralysed limbs in every instance below the natural standard.

In every case in which I have had an opportunity of making any inquiries, where the nervous energy has been materially impaired, the power of maintaining a healthy standard temperature has been in a greater or less degree lost, notwithstand-

* Since writing this paper, I have had an opportunity of seeing my patient, and of making an examination of the state of her hand. The little finger still remained nearly useless; she can bend it when the other fingers are bent, but possesses little or no power over it, independent of the others. She feels when severely pinched or injured, but her sensation in it is still very imperfect, and it conveys a wrong impression of the form of bodies and of their temperature.

It is always colder than the rest of the hand; on examining it with a thermometer I found that when the bulb was applied to the outside of the root of the little finger it stood at 56°; between the roots of the little and ring-finger 57°; outer side of the fore-finger 60°; between the fore-finger and thumb, and in the palm of the hand 62°. The heat of the other hand was on the surface of the different fingers 60°; between the roots of the finger, and in the palm 62°. The temperature of the room was 55°.

It is now January 20th, 1816,—just five years since the operation was performed.

ing the circulation of the blood has been apparently unaltered, either in degree or quantity: clearly, in my opinion, proving the important share which the brain and nerves have in regulating and producing animal heat; and showing, in a remarkable manner, that a perfect integrity of the nervous system is requisite to enable the body to resist the extraordinary variations of temperature to which it has been at times exposed, and to maintain under these different circumstances a standard heat of its own, with scarcely any perceptible thermometrical change.

I shall now proceed to consider, briefly, the phænomena produced on the nervous system by the changes which the blood undergoes in the round of circulation, and endeavour to ascertain how far such changes may be supposed to contribute to the production of animal heat; by observing the effect of any morbid alterations either in the quantity or quality of the blood, in augmenting or diminishing the temperature.* Previous, however, to entering on this subject, it will be right to premise, that it is not my intention to discuss the chemical nature of the changes effected by respiration, but simply to observe the sensible results of such alterations on the nervous system; as I do not conceive that it is of much importance to the present question, whether or not the venous and arterious blood contain the same proportions of oxygen, but in different states of chemical combination. It it sufficient to know that important changes do take place during the transmission of blood through the lungs, and that such changes are essential to the support of nervous action.

It is well known, that when from any cause the proper supply of arterial blood is suddenly arrested, and the brain deprived of its wonted stimulus, syncope ensues, accompanied with a great diminution in the warmth of the body. In malformations of the heart; in the blue child for instance, and in all

* The experiments of Dr. Davy, on the comparative heat of arterial and venous blood, prove that the temperature of the former is greater than that of the latter, and that the temperature of the left side of the heart is greater than that of the right. Here then we have demonstrative evidence of the acquisition of heat during the pulmonary circulation; we must therefore consider the circulation of the blood as *one* source of animal temperature.

cases of difficult transmission of blood, whether from disease in the lungs or sanguiferous system, the nervous functions are more or less deranged; such persons being very liable to faint, and being at all times subject to great coldness in the extremities and whole body, accompanied with numbness and imperfect sensation. These facts are so well known that it is not necessary to dwell further upon them.

On the other hand, where the circulation of the blood is morbidly increased as in fever, the nervous functions are greatly deranged by the over excitement, and generally during a paroxysm the temperature of the body is increased, in some degree, in proportion to the violence of the other symptoms. When a sudden or great determination of arterious blood takes place to the nerves of any part, it is known to produce a local affection similar to the more general derangement caused by determination to the brain. This is the case in many instances of amaurosis, which are remediable by copious bleedings.

The painful sensation produced by suddenly heating the hands after much exposure to cold, may likewise be referred to the rapid flow of blood over-exciting the nerves. When this takes place to a great degree, and when the alternation of temperature has been very sudden, inflammation and sometimes mortification is the consequence; on this principle we apply cold to a frost-bitten limb, and gradually increase the heat to prevent the effect of a sudden over-excitement of a part whose vital powers have been exhausted.

In no case, perhaps, is the effect of a local determination more marked than in *tic douloureux*. In every instance of this distressing malady which has fallen under my observation, during each paroxysm of pain, there was an evident increased flow of blood to the part, accompanied with an increase of heat more or less perceptible.

In the instance of Maria May related above, this was well marked. In a very interesting case, which I have lately attended, of affection of the nerves of the forehead and face, there was a well defined red line in the whole course of the supraorbitary nerve, accompanied with so much heat as rapidly to evaporate any cold washes which were applied. In another case of a middle-aged widow lady, who had been afflicted for years

with *tic douloureux* of the inferior maxillary nerve, for the cure of which she had submitted to several operations, but who still at times suffered from pain in the deep seated temporal branches, the gustatory nerve, and all the branches supplying the masseter, pterygoid and buccinator muscles; during each paroxysm there was a violent pulsation in all the branches of the external carotid artery, which terminated generally in a most profuse flow of saliva, after which she experienced temporary relief.

In all these affections, the local abstraction of blood and the application of cold are found most beneficial, and occasionally immediate ease is obtained, by forcibly compressing the part, and thus diminishing the influx of blood. A curious instance in illustration of this was lately mentioned to me. A blacksmith, who for many years had suffered from a violent pain in the nerves of the forehead whenever he exerted himself, accidentally found that he obtained ease by compressing the trunks of the temporal arteries; upon which he contrived a strong spring with a pad at each end, which he fixed on his head in such a manner as to compress the temporal arteries. This spring he wore whenever he went to work, and was thus enabled to remain at the anvil all day without suffering.

That there is an increased flow of blood to the part in these painful nervous affections, is not only shown by the redness and arterial action, but has been proved by an interesting dissection mentioned by Bichat, of a case of painful affection of the sciatic nerve, where the vessels of the neurilema were evidently enlarged in size, and increased in number, so as to be quite tortuous.

A singular instance, illustrating the effect of an inflammatory determination of blood to a nerve, occurred to me in the course of last year, and tends much to corroborate the preceding remarks.

Maria Williams, a foundling, aged 32, who had been retained in the hospital in consequence of a deficiency of intellect, in February, 1814, wounded her arm with a fork, and punctured the external cutaneous nerve, about half way down the fore-arm. She experienced much pain soon after the accident, in the whole course of the nerve, and considerable inflamma-

tion took place in the neighbourhood of the wound. She was directed to keep the arm very quiet, and to apply evaporating washes. About three weeks after the accident she had occasion to use the limb, when she was suddenly attacked with great pain and a sense of burning in the seat of the original wound. Erysipelatous inflammation soon spread over the whole front of the fore-arm, which terminated in several large vesications, giving an appearance very similar to the disease termed Pemphigus. The heat of the arm was very great, and quickly dried the damp cloths which were applied. By perfect rest, and evaporating poultices with opium, she soon recovered from this attack; but on attempting shortly after to use the arm, a recurrence of the same symptoms took place. The heat was so great this time as to lead me to ascertain its extent with a thermometer, when I found that the mercury rose nearly three degrees higher when applied to the arm, than when placed under the tongue. At this time vesication had taken place in some parts, and probably the temperature was lower than it had been in the previous stage of inflammation. Subsequent to this, she experienced four several relapses, all apparently induced by inadvertently using the arm. The last attack was in September, and differed somewhat in its character from the former; no vesications following the inflammation, and the appearance bearing more analogy to urticaria than to pemphigus.

The inflammation was always confined to the front of the fore-arm, and did not appear disposed to spread. The nerve during the whole time was acutely sensible when pressed. After September she retained her arm constantly in a sling for the space of three months, and has experienced no return of inflammation since.

The increased temperature in this case was very remarkable, and forms a striking contrast with the first case which I have related of crushed nerve, where the thermometer only rose to 74° when applied to the exposed cutis of a recently blistered surface. I consider this case as equally important in illustrating the action of arterious blood on the nerves, and in explaining the phænomena of inflammation. It is also strongly corroborative of the observations of Sir E. Home, detailed in some experiments which he published in the Second Part of the

Philosophical Transactions for the year 1814, proving the influence of the nerves upon the action of the arteries; for I conceive there can be no doubt that these violent inflammatory symptoms were all produced by the injury done to the nerve, as they could at any time be brought on by exciting it in any way.

It appears then, from the evidence which has been adduced, in the first place, that an integrity of the nervous system is essential to the evolution of animal heat, and that when any part of it is impaired by accident or disease, the due performance of this calorific function is either partially or generally deranged. Secondly, that the stimulus of arterious blood is necessary for the excitement of the brain and nerves, and likewise for the proper development of animal heat. Thirdly, that there exists a considerable sympathy between the nervous and sanguiferous systems, and that an injury inflicted on a nerve is attended with an increased arterial action, and a local determination of blood. Lastly, that such a local determination, whether the effect of disease or injury, is accompanied by a sensible increase of temperature at the part.

In conclusion, I shall offer some remarks on the curious phænomenon produced by placing a ligature on the principal artery of a limb, which has hitherto been difficult to account for, but which admits of a ready solution on the principle of vital heat being the result of the action of arterious blood on the nerves, (a conclusion which the facts related above would seem to warrant) whilst at the same time it affords a powerful illustration in support of such a theory.

When a ligature is placed on the principal artery supplying a limb with blood, the circulation in the smaller anastomosing vessels, and in the capillary system, is much increased. The limb is furnished with a smaller quantity of blood, but what does circulate must necessarily pass through vessels of a smaller calibre, consequently they are preternaturally distended with blood; and if a limb be examined under these cirumstances, it will be found that the communicating vessels are enlarged. They subsequently undergo a further change, and after some time again contract to their former size. The effect produced by these changes on the temperature of the limb, is an increase of

heat beyond the natural standard of the healthy limb, at that part immediately below where the artery is tied, which increase of heat gradually extends itself over the whole limb. This could not happen if the temperature depended solely on the circulation, as the actual volume of blood, the supposed source of heat, is lessened; but at the same time be it remembered, that the smaller order of vessels and the capillaries, in short those vessels which immediately supply the nerves, are receiving more than a due proportion, consequently the nervous system is over-exerted and more heat developed, first, at that part where there is the greatest impulse of blood, and subsequently over the whole limb, in proportion as the increased collateral circulation is established.

It may be urged in opposition to this explanation, that this increased temperature does not invariably follow the application of a ligature to the trunk of an artery. It will not be difficult to reply to such objections, when it is considered under what very different circumstances a ligature is applied, and that in many instances of aneurism the collateral circulation is in a great degree developed before the ligature is applied; in others, the main trunk below the aneurismal sac is obliterated; and in others again, a principal communicating vessel of the first order is given off a short distance above the situation of the ligature; all which circumstances would very materially influence the results, for reasons too obvious to require explanation. In all the instances, however, in which I have known a ligature suddenly applied to the main trunk of an artery, in a limb which had not undergone any previous change, the increased temperature above described has been the invariable consequence.

Berners Street, Dec. 28, 1815.

Observations on a Change of Colour in the Skin, produced by the internal use of the Nitrate of Silver. By I. A. ALBERS, M.D. of Bremen.

[From the Medico-Chirurgical Transactions, Vol. VII.]

THE skin of a woman, the history of whose distemper I shall communicate in the sequel, had contracted a blue colour all over the body. As there was not the least appearance of any disease in the heart, and as neither the circulation nor respiration were in the least affected, I was unable to trace the cause of this phænomenon; and I probably might have laboured in vain to discover it, had not my attention been drawn to it by a letter from the late Dr. Reimarus of Hamburgh, who informed me, that in his town two patients had exhibited a blue tinged skin, after the use of the nitrate of silver. Soon after I learned the same fact from Professor Rudolphi of Berlin, who was at that time still residing at Greifswalde, where a physician of the place had made the same discovery. I shall now state the history of the case, which I have myself treated, and in which there can be no doubt, but that the change of the complexion was to be attributed to the use of the above-mentioned remedy.

A fat women, aged 30 years, of a relaxed habit of body, but otherwise healthy, and the mother of four blooming children, in 1801 was seized, during the night, with epileptic fits, without there existing any cause that could be assigned for them: these fits returned four times in the interval of from four till six o'clock. I prescribed the nitrate of silver, in the form of pills, and in the following dose.

℞ Argenti nitrici gran. iv.

Micæ panis albi q. s. f. pilulæ ponderis granorum duorum no: 84. Obduc. fol. argenti.

Dosis mane et vespere quatuor.

Although after the use of these pills the spasms did not return, the patient continued them without my knowledge, near three years and a half without intermission; in the latter part of this period, however, she took them only in the evening.

Towards the end of the last year, she being then pregnant of her fourth child, the change of her complexion became first observable, and particularly so in her face. The tinge was at first bluish; it then grew gradually darker, till at last it became, as it has since continued, quite dark and almost black. This blue colour has spread all over the body, yet is most intense on the face, on the fore-part of the neck as far as the middle of her bosom, and on the hands and nails. Whenever the patient holds her arms in an erect posture, the blue colour is considerably lessened, and even disappears almost entirely. The sclerotica is likewise considerably coloured. The patient has on the arm a large scar, the result of a former issue, which appears quite white; at least I can discover no bluish hue in it. The blue colour is not of the same depth at all times, but often changes several times in one and the same day, without there being any determinate reason for it. At one particular time however, it appears strongest, namely, at the epoch of menstruation, after the accomplishment of which it again vanishes.

The patient's blood looks altogether like that of a person in perfect health. The woman is besides quite well, and does not experience the least impediment in breathing, and since the use of the nitrate of silver has only once had a relapse of her epileptic fits. A variety of remedies, for example, sulphuric acid, nitric acid, chalybeates, baths of different kinds, &c. have hitherto been exhibited to no purpose whatever. The colour has for these ten years remained the same.

The three following cases were communicated to me by Dr. Schleiden of Hamburgh; the two former of which, however, were observed by Dr. Chaufepié, who is resident there, and only the latter one by himself.

A lady, 35 years old, employed this remedy eight years ago, and her sister, 38 years old, ten years back, against epileptic fits; no cure, however, was effected by it; but merely a less frequent return of the paroxysms. In both the blue colour is visible at this very time, and more particularly in those parts which are exposed to the light, as the face, hands, neck, and articulations; the colour is less strong on the body. The latter patient is coloured deeper than the former.

The third patient was a young man of 20 years, the son of a

merchant of this town, born of an epileptic mother, and from his infancy afflicted with the same disorder. In this case there exists besides, from his early youth, an unconquerable propensity to onanism. All the remedies administered proved unsuccessful, and very frequently he was affected with three and four fits in one day. When I treated him five years ago, I exhibited the nitrate of silver, the only remedy that had not yet been used. He made use of it during a quarter of a year with the only effect, that at the end of this period the paroxysms returned only once in a fortnight. But as the efficient cause of the disorder still continued to operate, under which circumstances no cure could be expected, I thought it incumbent on me, to rest contented with seeing the frequency of the fits lessened, fearing lest the continued use, in large doses, of this corrosive remedy might injure the stomach of so weak an individual.

Although I do not recollect to have read any observation made by an English physician on this effect of the nitrate of silver, yet a hint given by Professor Autenrieth, at Tubingen, induces me to think that they are known in England. This respectable gentleman told me when I was at Tubingen last year, that he was almost sure to have met with some such observation in an English work, but he could not find it afterwards. Professor Reuss of Gottingen, who is so eminent for literary erudition, likewise hunted for it, but without any better success. Professor Autenrieth's assertion struck me the more, as many physicians of Geneva, with whom I conversed on the subject, and who are so deeply read in English literature, did not know of any observation of this kind made by English physicians. If, however, I have been anticipated, I hope the learned members of the Society will pardon me for communicating to them these remarks, and those of my two friends Dr. Chaufepié and Dr. Schleiden. I am anxious to collect information from all quarters on this subject, and shall be most thankful to any of the members of this highly respectable Society, for any information they may please to communicate to me; for which purpose I take the liberty of subjoining the following questions.

1st. As the blood in these patients is of the natural hue, can it be doubted, but that the blue colour must be looked for in the reticula Malpighiana, in which it is produced by the nitrate of silver?

2d. Why does this effect of the remedy occur so seldom? and why does it often not take place at all, when exhibited in very copious doses, but not long continued, as is proved by an essay lately published by Dr. Powell?*

3d. Is there any probability that this change of the cutaneous colour is produced by the protracted application of the remedy? If this were the case, the second question would be answered.

4th. Why do the parts exposed to the light, more particularly contract a blue colour?

5th. What remedies might be prescribed to cure this alteration of the skin?

Additional Facts relative to the subject of the preceding Paper. By P. M. Roget, M. D. F. R. S. Physician to the Northern Dispensary.

Having some years ago met with an instance in which a change has taken place in the colour of the skin, similar to that described by Dr. Albers in the preceding paper, and arising from the same cause, I am induced, with the approbation of the council, to subjoin to it a brief account of the history of this case, as well as of some others which have occurred on the continent: for it is only by accumulating evidence on the subject, that we can hope to arrive at the true theory of this singular phænomenon.

A young lady, about 25 years of age, while apparently in good health, was seized with an epileptic fit, which lasted twenty minutes. The misletoe, aided by occasional cathartics, was taken for a long time without any apparent advantage, and a second attack occurred about three months after the first. It was more violent, and continued above an hour. I then directed her to begin a course of the argentum nitratum, in the form of pill: gradually increasing the dose from one to two grains, three times a day. At an interval of two months a third fit occurred. The dose of the remedy was still further increased, but another attack was experienced at the distance of three

* Observations on the internal use of nitrate of silver, in certain convulsive affections. By Richard Powell, M.D. Medical Transactions, published by the College of Physicians in London.

weeks from the preceding: it was, however, much milder than the last. The fits now continued to recur at irregular intervals of two or three weeks; but were on the whole becoming less violent and at length ceased altogether, between nine and ten months from the period of the first attack. The dose of the nitrate of silver had by this time been increased by little and little, till the quantity taken amounted to 18 grains in the four and twenty hours. It was continued in this quantity with occasional intermissions of ten days or a fortnight, for four or five months, and then left off by gradual diminution of the doses. During the whole period that the patient was taking this medicine, her general health continued to improve, and she got rid of a variety of nervous feelings to which she had before been subject. Some time *after the remedy had been totally discontinued*, she observed that the tongue and fauces had acquired a very dark colour, as if stained with ink: this for a time increased, and afterwards somewhat diminished; but a considerable degree of blackness in those parts has remained permanently fixed. About a year and a half after she first began to take the nitrate of silver, and several months after she had entirely left it off, it was observed that the complexion was growing dark: this was first noticed about the eyes, but not particularly about the lips. This change has gradually proceeded, without any perceptible derangement of health, affecting equally the skin over the whole body. It appears to have attained its maximum in the course of a year, and though it is now six years since she has taken any preparation of silver, still continues with nearly equal intensity. It is liable to occasional variations, which I have not, however, been able to trace to any determinate cause: the period of menstruation, in particular, has no apparent connection with these changes. Of late years her health has been considerably deranged, apparently from the predominance of a nervous temperament; but there has not been the slightest threatening of her original complaint.

The effect in question has been noticed by Fourcroy,* as appears by the following passage: "Un ministre protestant des environs de Hambourg, attaqué d'une obstruction au foie, prit,

* Medecine éclaireé par les sciences physiques. Tom. I. p. 342.

par le conseil d'un empirique, de la dissolution nitrique d'argent. Ayant continué pendant plusieurs mois l'usage de ce remède, sa peau s'altéra insensiblement, et elle devint enfin presqu' entièrement noire. Il y avait plusieurs années que cette couleur durait, elle commencait pourtant a diminuer." It does not, however, appear that this observation had attracted much attention, since no analogous instance had been recorded till very lately. Dr. Butini, junior, in an inaugural dissertation, published at Geneva last year, "*De usu interno præparationum argenti*," after stating the above-mentioned remark of Fourcroy, gives the history of three cases, two of which were observed by his father, and one by himself, of the same dark hue in the skin following the long continued use of the nitrate of silver for the cure of epilepsy. In the first of these, the disease had supervened on an attack of hemiplegia, and threatened by the violence and frequency of its attacks to terminate by sudden death, or to destroy at least the mental faculties. All the ordinary remedies having failed, the nitrate of silver was tried, and its use continued for two years and a half, in which period 33½ drachms were taken, making an average of 2½ grains per day. The paroxysms were by this treatment rendered so mild, as hardly to partake of the epileptic character; and their tendency to recurrence was detected only by slight attacks of nervous anxiety and perturbation of mind. In the mean time, however, the face acquired a singular purple hue; this change being ascribed to the remedy used, it was discontinued, and the subsequent cure entrusted to the efforts of nature. Five years have since elapsed, during which time there has been no recurrence of epilepsy, and the mind has continued sound; but the dark colour of the skin has daily become more intense. The head, and especially the face, is tinged with a deep violet approaching to black, and having a complete similitude to the negro, or to a bronze bust. The hands are as deeply coloured as the face. The sclerotica is but little changed: the rest of the body, which is covered by the clothes, has preserved its natural hue, with the exception of a very slight tinge scarcely perceptible unless in the shade, but still sufficiently manifest to show that the whole skin has partaken of the affection produced by the silver.—In the second case, 7½ drachms of the nitrate were

taken in the space of 15 months, which corresponds to a daily dose of one grain. The change in the colour of the face did not take place till after the disease had been completely cured. At the end of three years, no relapse had occurred, but the darkness of the complexion continued, though in a somewhat less degree.

Another case is detailed by Dr. Butini, as having occurred in the practice of Professor Delarive of Geneva. The epilepsy had affected the patient from the age of 12, and had continued with great obstinacy for four years. The nitrate of silver was at length resorted to; beginning with half a grain daily, and increasing this quantity every fortnight by half a grain. By pursuing this plan of treatment, the intervals between the paroxysms were much protracted; but the use of the remedy being interrupted in consequence of the patient's travelling, they again became frequent, and it was resumed in the quantity of three grains daily, which was soon increased to six. The disease now, for the first time, appeared effectually to give way; and at the end of eight months, during which the remedy has been regularly continued, no distinct paroxysm had occurred, though there were several slight and transient affections which appeared to be connected with the disease. In this case also a slight blueish tinge is beginning to be perceptible.

I may, perhaps, be allowed to subjoin another case of epilepsy which has lately occurred to myself, in which I had prescribed the remedy in question, with the most marked beneficial effect on the disease: its attacks now occurring only at very distant intervals. I understand the same change in the colour of the skin, as in the other cases, is beginning to take place; but as my patient is on the continent, I am unable to state the fact otherwise than from the report of those who have lately seen him.

P. M. ROGET.

June 20, 1816.

SELECTED REVIEWS.

A Treatise on the nature and Cure of Gout, comprehending a General View of a Morbid State of the Digestive Organs; and of Regimen; with some Observations on Rheumatism. By CHARLES SCUDAMORE, M. D. &c. 8vo. pp. 402. Lond. 1816.

[From the London Medical Repository, for October, 1816.]

THE epithet *Opprobrium Medicinæ*, which has been applied to a few of the long list of evils over which the healing art has endeavoured to extend its dominion, has, particularly in the disease which forms the subject of the volume before us, too often damped the ardour of inquiry in those who were the best qualified to investigate its causes, and paralysed the efforts that might have been otherwise successfully exerted in fixing its treatment on sound and rational principles. The young practitioner has hesitated to employ in gout those means by which he knows he can readily control similar symptoms in other forms of disease, on observing his elder brother in art an idle spectator of its baneful influence; while the patient himself, after finding that regular medicine has aimed at little more than palliating the urgency of his sufferings, has either himself strayed into the path of empiricism, and become his own physician, or has fallen the victim of impudent pretension and unblushing imposture. To attempt, therefore, an inquiry into the nature and cure of gout, upon scientific principles, is a merit of itself, independent of the success that may attend the effort. How far our author has succeeded, we shall endeavour to enable our readers to decide.

In his preface, after a rapid sketch of the causes which have contributed to render the treatment of gout empirical, even under the care of the regular practitioner, Dr. Scudamore points out the following general positions, as the ground-work upon which he has built his reasonings regarding the nature of the disease, and the method of treating it:

"That the gout is a disease not only injurious to the constitution, but destructive of the organization of the particular

textures which it affects; and, by such united influence, tends both to shorten and embitter life:

"That it is as completely within the useful influence of Medicine as any other severe disease:

"That the fit may be immediately relieved in its painful symptoms, and materially shortened in its duration:

"That most of its natural bad consequences may, by timely care, be prevented; and, finally;—

"That all these advantages may be afforded by means, which, in removing the disease, tend at the same time to restore the constitution."—p. xii, xiii.

As to the security from future attack, he justly regards that as being altogether within the patient's own peculiar care, provided the paroxysm and the period of convalescence have been properly managed.

The first section of the treatise is a comment upon the definitions of Cullen, to which Dr. Scudamore offers several objections. In the general definition, he objects to the term *Morbus hæreditarius*, as the disease very frequently occurs where no hereditary reference can be traced; and, also, to the assertion, *oriens sine causa externa evidente*, as the disease may be called into action by "a sprain, contusion, or any kind of local injury," when the predisposition to it exists. With less justice he objects to the term *pyrexia*, and to the implication that the joints of the extremities are the seat of true gout; for although there are certainly cases which may be advanced as objections to both these parts of the definition, yet, as it is impossible that a definition can embrace every anomaly, it should be framed from the symptoms attending the more perfect paroxysm, which are generally the earliest of the disease; and it can scarcely be denied that these are attended with fever, and that the seat of pain is one or other of the joints of the hands or feet. We are indeed more surprized at the last objection, as in a table which we shall afterwards quote, out of seventy-one cases of first attacks, sixty-nine were in the feet and hands. We, however, readily admit, that the appellation, *Arthritis*, is preferable to that of *Podagra*, adopted by Cullen. His remaining remarks on the general definition are still more hypercritical.

With regard to the varieties, our author condemns the terms *regular*, *atonic*, *retrocedent*, and *misplaced;* particularly the three latter, as favouring a carelessness of observation in the practitioner, who, under the term irregular gout, "considers himself as excused from the difficult task of nicer discrimination; and, instead of these, proposes to divide gout into *acute*, *chronic*, and *retrocedent*." He considers Sydenham as the first author, "who wrote with much perspicuity on gout and rheumatism:" but his doctrines were clogged with all the prejudices of the humoral pathology. The following are the definitions offered by Dr. Scudamore:

"Gout.—A constitutional disease, producing an external local inflammation of a specific kind; the susceptibility to it often depending on hereditary bodily conformation and constitution, but more frequently wholly acquired; not occurring before the age of puberty, seldom under the age of five and twenty; and most frequently between the ages of twenty-five and thirty-five; affecting chiefly the male sex, and particularly persons of capacious chest and plethoric habit; in the first attack invading usually one foot only, and most frequently at the first joint of the great toe; but in its returns affecting both feet, the hands, knees, and elbows, not only in the articular structure, but also in the other textures belonging to the moving powers, different parts being affected together, or in succession; often accompanied with sympathetic inflammatory fever, which is marked by nocturnal exacerbations and morning remissions; much disposed to return at periodical intervals, and often ushered in by premonitory symptoms.

"Acute Gout.—Inflammation and pain of the articular, tendinous, or bursal structure, usually attacking one part only at the same time, but in succession of attack affecting different parts together; with preternatural fulness of the adjacent veins, and in certain situations, with œdematous swelling of the integuments, occurring in twenty-four or forty-eight hours from the invasion of the fit; vivid redness of surface, which is sometimes shining; entire disability of the affected part, with peculiar sensations of burning, throbbing, cutting and pricking, and weight; the action readily changing situation spontaneously, or from slight causes; terminating almost invariably without

suppuration, and usually with critical indications of the event.

"CHRONIC GOUT.—Inflammation and pain more slight, irregular and wandering, than in the acute; faint redness of surface, much permanent distension of parts, or continued œdema, and impaired moving power; without critical indications of its terminating; associated with a morbid state of the digestive organs, a languid or oppressed circulation, and much nervous irritation in the system.

"RETROCEDENT GOUT.—Metastasis, or transference of the gouty action in the paroxysm, from the external part, to some internal organ."—pp. 15—17.

These definitions are certainly much too long, and embrace too many objects; brevity being the essence of a definition, which should entertain the more prominent characteristics only of the object, or the action described, by which it is distinguished from every other object or action. A definition should also be of such a length only as to allow of its being easily committed to memory.

The history of acute gout is divided by Dr. Scudamore into *premonitory symptoms*, the *paroxysm* comprehending the symptoms of a first fit and those of subsequent attacks, and the *sequelæ*.

The disease is not preceded by premonitory symptoms in every instance; its invasion in the first fit being more commonly immediate, and generally happening in the night: but often symptoms occur for several days, which announce the approach of the disease. These are well and accurately detailed by our author. They are chiefly those of dyspepsia, attended with anomalous pains and feelings of directly opposite natures in different constitutions. We are rather surprised not to find noticed amongst them severe and continued sneezing, a premonitory symptom which we have observed in more than one patient.

The history of the paroxysm, we are told, is drawn up "from the results of our author's own experience and careful observation." The first fit, he informs us, in the majority of cases, "makes its attack between twelve and three in the morning:" and the great toe of one foot only is the part affeced; but besides the pain, stiffness, burning, and throbbing in

the part, fever and restlessness supervene, and continue for two or three hours, when they yield to gentle perspiration, and some sleep is procured. The degree of pyrexia, however, he regards as altogether sympathetic, and "proportioned to the local inflammation and pain." From seventy-one examples, under his "own observation," he has drawn up the following comparative table "of the parts affected in the first fit."

"In the great toe of one foot only, forty-nine cases. In the great toe of each foot, four.—In the toe and instep, two. In the outer side of one foot, two.—In one ankle, two.—In each ankle, one.—In ankle and instep of one foot, one.—In toe, instep, and ankle of one foot, one.—In instep of each foot, one.—In heel of one foot, one.—In each foot and hand, one.—In one toe and thumb, one.—In right knee, one.—In left knee, one.—In one hand at the back, one.—In one wrist, one.—In each hand at the back, one."—p. 24.

The frequency of subsequent attacks depends on "the constitutional tendency to the disease, and the mode of life of the patient. The same foot is generally affected, "but it seldom happens that the other foot escapes."

Under the title of *Aggravated Returns of Gout*, after describing the usual external appearances of the disease, our author hazards the following theoretical opinion:

"When the cellular parts have been for some time swollen and tense, the blood which has stagnated in the strictured vessels ceases to give the vivid blush of red, and changes to the different shades of purple."—p. 27.

Now we conceive it to be quite an assumption, that there is stricture of the vessels; and, if there were, it is not very probable that the blood would stagnate in them; but if any stagnation occur, it would more probably be before the strictured parts of the vessels, which would necessarily be dilated beyond their ordinary diameter, by the accumulated blood.

The severity of the pain inflicted by gout is almost proverbial: our author observes, that observation has taught him that it is most urgent when the elbow-joint and the tendons at the wrist are the parts affected. The temperature of the part, as indicated by the thermometer, we are told, is "greatly beyond the natural standard;" an expression much stronger than his

experiments to be afterwards noticed authorises. Several cases are quoted, as described by the patients themselves, to exemplify, in a striking and familiar manner, the severity of the local symptoms.

Having detailed the local effects of the disease, Dr. Scudamore proceeds to notice the constitutional symptoms of the paroxysm. These more generally resemble those attendant on an aggravated attack of dyspepsia; the intestinal secretions are foul and offensive; and the urine, which is scanty and of a deeper colour than natural, is much increased in specific gravity; and, on cooling, "deposits a pink or brick-dust sediment, with much mucus." There is some degree of incorrectness in regarding the deposition of the pink sediment as one of the symptoms occurring during the continuance of the paroxysm, as it does not begin to appear until it is fairly over, or the crisis is passed. "The sensibility of the nervous system is highly excited; and a general febrile action accompanies the local inflammation." Acute gout leaves, as sequelæ, dyspepsia, a disposition to hypochondriasis and apoplexy; occasionally a diseased condition of liver; and our author has met with chronic splenitis in two very gouty females. Gout has generally been supposed to leave also a disposition to calculous complaints, an opinion which does not accord with the experience of Dr. Scudamore, who observes that, "calculus of the bladder is a very unfrequent complaint amongst gouty persons." The local changes produced by gouty inflammation are well described. The gouty concretions (commonly called *chalk-stones*) occur only in a few individuals of particular gouty idiosyncracy.

"They result from inspissation of the peculiar morbid secretion which constitutes their composition, and are found in various situations from within the synovial membrane of the joint, even to the layers of the cutis. I have found them in the living subject, filling the bursæ, and condensed to great hardness; in the sheaths of tendons feeling almost stony; in the cellular membrane either in hard or soft lumps; and under the cuticle, pressing for escape."—p. 39, 40.

Dr. Scudamore, like preceding writers, has divided the remote causes of gout into *predisposing* and *exciting*, a division,

however, which has occasioned much confusion, scarcely two authors agreeing which are to be regarded as predisposing, and which as exciting causes. Under the predisposing we find *hereditary predisposition* first mentioned; a cause which has been pretty generally regarded as being more evident in gout than in any other disease. Our author does not deny the hereditary nature of gout; but he maintains that it is more frequently acquired, and satisfactorily supports his opinion by the following comparison:

"Of 77 patients, the number of those in whom the disease

was hereditary from the father, was	- - - - -	21
mother,	- - - - -	5
father and mother,	-	3
Of those whose grandfather only had gout,	- -	3
grandmother only had gout,	-	1
aunt only in the family had gout,		1
Not known either on the father's or mother's side,		43

"From this statement it appears, that the cases of acquired gout, in which no family reference could be traced, were to the rest as 43 to 34; and in the examples contrasted with those immediately hereditary, as 43 to 29."—p. 42.

Although we are willing to admit "the exemption of youth from gout," and its more frequent occurrence at adult age, yet, we cannot conceive how *adult age* can be placed as a predisposing cause of the disease. The fact is, that at this period many other predisposing causes begin to operate; as, for example, habits of indulgence as to food and sexual intercourse. From a tabular view, exhibiting the period of the first attack in sixty-four cases, more than two-thirds appear to have occurred between twenty-five and forty years of age. Another tabular comparison in relation to stature and bulk of 118 cases of the disease, shows that 41 males and 7 females were tall and corpulent, while 6 males and 4 females only were short and slight; hence we allow that our author is authorized in regarding *particular bodily conformation*, as a predisposing cause; and as justly are *constitution and temperament* set down under that head. We would make the same remark, on the ranking *the male sex* as a predisposing cause, as we have just made on adult age; and the author himself supplies us with an argument.

"The more common occurrence of this disease in men than in women, must without doubt be principally referred to the chief remote cause, excess in living, and especially excess in wine, being applied in a greater degree to the former. But in addition to this circumstance, the superior delicacy of the female structure and habit, puts some restraint on the acquirement of the inflammatory and plethoric state of vessels which appertains to gout. The actions of the uterus are not without effect in counteracting a general redundancy of blood. A gout of imperfect development, or of a chronic form, is more common in women than in men. It is also seldom acquired in the former, unless with the concurring influence of hereditary predisposition. In the few exceptions which do occur to this general rule, we meet with the circular chest, large full veins, relaxed solids, and tendency to corpulency, which have been already described as prevailing in gouty men."—p. 106, 107.

The other predisposing causes enumerated by Dr. Scudamore, to which we conceive no objection can be made, are *station of life and occupation*, *state of mind*, *animal food*, *indolence*, *plethora*, *nimia venus*, *a morbid state of the digestive organs*, and *variable climate;* each of which are fully and ably illustrated. The acquired predisposition to the disease, he asserts, depends on unhealthy assimilation, a state of which it is difficult to judge, because it is often conjoined with an active appetite: but, although the powers of the stomach may be apparently sufficient for the digestive function, yet, it is justly remarked, that this organ only begins the process; and a morbid interruption to any part of the train of digestive "functions, may become a predisposing or [an] exciting cause [of] gout." The most remarkable symptom which marks the seat of the dyspeptic symptoms being the intestinal canal, is an increased secretion of mucus, which assumes a gelatin-like appearance, and detached from the fæces when passed. This appearance of the mucus, which is not well described by our author, is often very remarkable. We have seen it many yards in length, assuming an appearance very similar to that of tape worm.

Severe study and *strong liquors* ought certainly to be considered rather as *exciting* than *predisposing causes;* and in support of this opinion, particularly with regard to severe study,

we would advance the observation of Sydenham, quoted by our author, "that his immoderate application to the composition of his treatise, occasioned him the severest fit of the gout which he ever had."

The first of the exciting causes, noticed by our author as such, is *excessive intemperance*, a cause regarding the operation of which there can be but one opinion: the second is *acidity*, which, when "much accumulated in the primæ viæ," will sometimes prove alone sufficient to excite a fit, and always powerfully concurs with other causes. The third cause mentioned, *excess of bile*, we think more questionable; and it is not improbable that the jaundiced skin and symptoms of increased hepatic action, said to "occur as the short precursors of a paroxysm," are really sympathetic symptoms of the actual presence of the disease, although the local and more obvious effects be not yet evident. There can be no doubt of the propriety of regarding *cold* as an exciting cause of gout; and the same may be said of *external injuries* and *passions of the mind*, in the strongly predisposed.

Dr. Scudamore next enters upon a more difficult discussion, and one which, to employ his own language, has proved an *ignis fatuus* to medical theorists—*the proximate cause* of gout. In noticing the doctrine of a *morbific matter*, which appears to have taken its rise from the uric concretions, commonly called chalk-stones, that appear on the extremities of some gouty individuals, he enters into an examination of the nature of the pink sediment deposited in the urine on the decline of each paroxysm; and has satisfactorily, in our opinion, proved, that the theory supported by Vogel* and other French chemists, which supposes this to be a distinct acid, the rosacic, is by no means demonstrated: but, on the contrary, that it is simply uric acid modified by some principle, probable animal matter, which is separated from it by the action of other acids; for example, as the sulphuric and sulphureous, in which it is soluble. The presence of this sediment, however, he contends, is "not to be considered as a proof of an excess of uric acid; but ra-

* A translation of Vogel's Observations and Experiments upon the Rosacic Acid appeared in the *Repository*, vol. v. p. 431.

ther as a separation of this principle from the urine, and a new combination with some other of its elements." The urine containing it, he ascertained by experiment, is of a high specific gravity; and he found that its appearance and quantity in the urine was always connected with and in proportion to the unhealthy state of the chylopoetic functions, but neither "necessarily nor regularly attendant on a paroxysm of gout."

Having negatived the suggestion, that the proximate cause of gout is an excess of uric acid, our author next proceeds to examine that theory which attributes it to an *excess of phosphoric acid.* This opinion was suggested by Berthollet, who imagined that his observations led him to conclude, that phosphoric acid is naturally in much smaller quantity in the urine of individuals subject to gout than in healthy persons; "but that at the approach of a paroxysm, and during its continuance, the urine contains as much of phosphoric acid, as that of persons of strong constitution, and much more than belongs to the gouty in their ordinary state." Thirty-seven experiments of Dr. Scudamore, to ascertain the truth of Berthollet's opinion, are perspicuously detailed, and a tabular abstract of the results given from which it appears, that although there is really an increased proportion of phosphoric acid in the urine of persons labouring under a paroxysm of gout, yet, that the same circumstance occurs in persons suffering under other diseases, as for example, diseased liver and continued fever, who had never had gout. He, therefore, properly concludes, that as "the phenomenon in question cannot be considered as a specific occurrence in gout alone," it cannot be regarded as the proximate cause of that disease.

As we conceive every information connected with the cultivation of animal chemistry cannot be too widely diffused, we extract the method employed to ascertain the quantity of phosphoric acid in the urine examined by Dr. Scudamore.

"In these experiments, nitrate of lead was the precipitant employed; and the urine was diluted with distilled water. A portion of the urine, first and separately passed in the morning, was, in each case, chosen for examination. The precipitate was carefully dried and scraped from the filter. Of this a certain quantity was boiled in water, that the muriate of lead might

be removed; and with it also the uric acid was separated. It was then burnt in a crucible for about half an hour, that the several animal matters should be destroyed as much as possible. It was next boiled in diluted nitric acid; and being allowed to rest, the clear liquor was decanted from the sulphate of lead and some insoluble animal matter. To this ammonia was added in excess; the precipitate was collected on the filter, dried, and weighed. This was the phosphate of lead, from which the relative proportion of phosphoric acid was estimated, by means of Dr. Wollaston's logometric scale."

Our author briefly mentions some incongruous opinions of Barthez, the most copious of the French writers on the subject of gout; and then notices Dr. Sutton's theory of a morbific secretion in the alimentary canal being the proximate cause of the disease; an opinion which he regards as not only gratuitous, "but much too restricted in its views;" and considers as generally less objectionable Dr. Parry's idea, "that the gout is a disease depending on certain conditions of the circulating system." He very prudently advances no direct theory of his own under the head proximate cause: but in proceeding in the investigation of the ratio symptomatum, he arrives at the following conclusion:

"That gout is a disease depending on a redundancy of blood with relation to the powers of the circulation, particularly affecting the system of the vena portarum, and the consequent functions of the liver; together with the production of a morbid change in the secreting functions of the alimentary canal in general, and of the kidnies in particular."—p. 123.

The formation of uric concretions, our author conceives, does not necessarily require "an active inflammatory action of vessels," or acute state of gout. He thinks also, that when it does occur, "the capillary vessels of the part affected with gout may act *vicariously*, in a greater or less degree, to the secreting vessels of the kidney." In some instances in which there were concretions both on the hands and feet, uric acid was almost totally absent from the urine. He thinks the circumstance of ligaments, the sheaths of tendons, and aponeuroses, being more frequently the seat of gout, is the reason why the local affection rarely terminates in suppuration. In the

only case of gouty abscess which he has seen, "the purulent secretion was formed wholly in the common integuments;" and the result was modified by an attendant secretion of urat of soda. Neither does gouty inflammation produce coagulable lymph, the thickened state of parts being referable to "a change of structure in the ligaments, the bursæ, and the tendinous sheaths; and also from the morbid secretion of the two last textures."

Gouty inflammation, "when attended with severe pain," produces, according to Dr. Scudamore's observations, a much stronger sensation of heat in the affected part, in relation to the real quantity evolved, than is occasioned by rheumatic inflammation: to illustrate which fact some experiments are detailed, from which it appears, that the sensation of heat in gouty inflammation "corresponds rather to the degree of pain which is present, than to the thermometrical temperature of the affected parts."

After pointing out the diagnostic characters by which gout may be discriminated from rheumatism, erysipelas, and phlegmon; and the symptoms on which a prognosis may be formed; our author proceeds to the consideration of the more important part of his subject, the treatment of the disease.

In taking a general view of *the treatment of gout*, Dr. Scudamore with much reason condemns Sydenham's prohibition against any interference in the paroxysm; an opinion which unfortunately too long swayed the practice of his successors.

"I would assume it therefore," adds he, "as a principle, that we should attempt the prevention of a fit of gout, if warned of its approach, and interrupt its progress when formed, *unless* such a state of the constitution exist, that the gout has taken the place of another more serious disease, or may be expected to prevent one which is threatening, and more to be dreaded than itself."—p. 146.

The detail of the treatment commences with that of the *premonitory symptoms;* which, if the inflammatory diathesis be present, are to be combated by bleeding; by promoting the hæmorrhoidal discharge, if there be any tendency to it in the constitution; and removing costiveness by active purgatives; in conjunction, if heartburn and other symptoms of dyspepsia

exist, with the administration of an ipecacuanha emetic. When the secretions remain in a vitiated state, small unirritating doses of mercury, bitter aperients and alkalies, with careful moderation in diet, horse and foot exercise, country air, and changing all the *lædentia* for the *juvantia*, are the remedial means to be pursued.

Before proceeding to describe *the treatment of the paroxysm*, our author offers the following prefatory admonition:

"In our choice of remedies for the particular symptoms which appear in every individual case, we should reflect upon the kind and degree of the predisposing and exciting causes, by which the fit has been introduced; and our practice should be relative to such consideration, as well as to the age, constitution, and temperament of the patient."—p. 148, 149.

He then proceeds to detail the treatment under the heads "of the several remedies which" he has "thought most deserving of attention." We propose to follow him through this arrangement.

Bleeding.—With regard to the employment of the lancet in the paroxysm of gout, our author agrees with the opinion of the best practitioners, that although when circumstances, as cold and wet, or excess, have occurred to render the inflammatory diathesis more permanent, bleeding is the proper remedy; yet, it "is not allowable with the same freedom as in the other phlegmasiæ." When it is proper, however, "its early employment is a point of much importance:" but although the degree of the general inflammatory action, and the effect produced, must necessarily regulate the quantity to be abstracted, and the repetition of the venesection, yet, we are told, "it should be in relation to the powers of the individual rather than to his age;" a remark, which we believe is as applicable to every other form of disease as to gout. When there are marks of congestion in the hepatic or cerebral circulation, "ample local cupping is to be preferred to the lancet."

Emetics.—The experience of our author does not induce him to advise their employment, except when the stomach is loaded with acid or other irritating matters; yet, a very striking instance is detailed of the good effects of one which was exhibited in the commencement of the attack.

Cathartics and Diuretics.—"On the choice and free employment of these" we are informed the successful treatment of the paroxysm chiefly depends. This action particularly unloads "the vessels belonging to the system of the vena portarum;" and the efforts of Nature to remove redundant matter are assisted, by their stimulating to increased action at the same time the exhaling [excreting] vessels of the alimentary canal, and the secreting functions of the kidnies. Although, under certain limitations, Dr. Scudamore regards elaterium to be a medicine as useful as it is purgative, yet his own experience leads him to prefer calomel joined with antimonial powder, compound extract of colocynth and soap; and where a combined and continued action upon the bowels and kidnies is required, magnesia and sulphate of magnesia; conjoined with acetum colchici. He gives the latter combination at intervals, so as to procure from four to six stools in twenty-four hours, "until the fæces and urine acquire healthy characters; and the tongue becomes clean and moist; and adds,

"This preparation of colchicum, joined with direct purgatives, has never disappointed me in its effect, either to *assist* the other ingredients in the production of watery evacuations from the bowels, or to increase the urine abundantly, or both."—p. 156.

Mercurial Preparations.—Mercury, in small doses, combined with antimonials, or in a full dose with purgatives, produces excellect effects; but when exhibited so as to produce mercurial fever, or irritation, it proves extremely injurious. Three cases are noticed illustrative of this fact.

Dr. Scudamore next adverts to a few of those remedies that swell the ample list of *pretended specifics*, which have had the greatest share of popular estimation. The *tincture of Hellebore and Opium* he has seen injurious in several cases; in one it even apparently brought on apoplexy; and he thinks that, in any form of combination, hellebore "should be intirely deprecated as a remedy for gout." From *Gratiola* he has not obtained any satisfactory results, and is rather inclined to think it an inert medicine: and, although he speaks favourably of the *acetum Colchici;* yet, of both the powder and tincture he observes, "from neither have I been able to trace the

smallest *specific* operation; on the contrary, the stomach was irritated," and an increased fur of the tongue with thirst induced. Our own experience accords with this observation. Of the *eau medicinale* he speaks more at length. From the result of some experiments on the preparations of Hellebore and laudanum, the tincture of Colchicum, and that of Gratiola, he does not give credit to any of the supposed discoveries of its composition; and his own experience of its effects as a medicine enables him to state, that, although at first "it proves in most instances a powerful palliative or short cure, yet, it ultimately insidiously leads to a train of subsequent evils, an impaired condition of the nervous system, weakened digestion, and indolent bowels;" while "the limbs, especially the parts affected in the paroxysm, suffer for many weeks with tremblings, numbness, and coldness, and commonly with tedious œdema." He adds, "it may with truth be stated, that sooner or later, in proportion as it is freely employed, it leads to a broken state of health." We cannot from our own experience speak of this remedy; but, although our author supports his opinion by the high authority of Dr. Gregory, and we are averse from supporting any thing which favours of quackery, yet justice obliges us to state, that we knew several instances in which it has been productive of the most salutary effects, and where it continues to prove beneficial, notwithstanding the long continued employment of it.

Peruvian Bark.—The favourable testimony of Dr. Tavares and Dr. Small of the effects of bark; and Dr. Held's eulogy—"uno verbo, cortex peruvianus in podagra *divinum est remedium*," have not induced Dr. Scudamore to make trial of this medicine. *Sudorifics*, he thinks, should be given with caution; as the powerful relaxation of the skin increases its susceptibility "to changes of the atmosphere at the period of convalescence, and the consequent danger of relapse."

Narcotics.—Nothing so soon or so effectually relieves the pain of gout as opium; but its beneficial effects are altogether "dependant on the manner of its use, both as to preparation and dose:" and as a general rule, our author observes, "any inflammatory diathesis, and a constipated state of bowels, should be removed previously to its administration." The following is our author's method of employing this remedy.

"The patient, being furnished with twelve pills, each containing one grain of *crude* opium and half a grain of antimonial powder, may be desired to take one, two, or, if pain be very severe, even three, at bed-time, as the first dose, and repeat one every hour or two afterwards, according to the degree of pain; this being the only regulation as to the quantity to be employed, when no contra-indications are present."—pp. 170, 171.

Now we see no objection to this mode of exhibiting the opium; but of what use the antimonial powder can be in half grain doses, we cannot conjecture. When, from peculiar idiosyncracy opium disagrees, Dr. Scudamore recommends the use of henbane; but he justly places little dependance on *humulus lupulus;* indeed the experiments of Dr. Bigsby* are sufficient to raise doubts of the utility of this preparation in any case.

Some excellent rules are laid down for the regulation of *diet and bodily exertion*, the latter of which, cautiously employed, even in the paroxysm, counteracts in a great degree the consequent stiffness, debility, and lameness.

In detailing the *local treatment* in the *paroxysm*, the same method is adopted as in the history of the constitutional treatment, our author's opinions being separately delivered under the head of each remedy. He does not recommend the employment of *leeches*; and even adds, that their indiscriminate use "in gouty inflammation is by no means innocent;" nor does he appear to think more highly of opening the distended veins near the inflamed part. Of the effects of *vesicatories and irritants* he has had no experience: external *warmth*, he thinks, worse than useless; and prefers sponging with tepid water to *poultices*, as commonly employed, to the *pediluvium* or *the muriatic acid bath*, which in one case he found productive of an aggravation of pain and inflammation. He enters fully into a refutation of the practice revived by Dr. Kinglake, on "the narrow principle," as he properly terms it, "of considering the gout as a local disease;" and lays it down as an axiom, that the local treatment, although not to be neglected, yet, is

* Vide Repository, vol. iv. p. 287.

always to be regarded as of secondary importance. Instead of cold water therefore, he recommends the following lotion, which he has employed in forty cases with the best effects; and without ever occasioning any metastasis of the inflammation:

℞ Alcoholis ℥viii.
Misturæ camphoræ ℥xiv. M.—Fiat lotio; modice tepefacta ab additione paululæ aquæ calidæ, et partibus affectis constanter adhibeatur.

The temperature of this application should not be under 75°, nor exceed 85°; for if "either hot or cold, the intention of the remedy is frustrated." It should be applied by means of a linen compress consisting of several folds; "and the slightest and coolest covering should be superincumbent."

With regard to the state of *convalescence*, Dr. Scudamore with much propriety remarks, that "careful regimen, both as to diet and exercise, early hours, and a due regulation of the bowels," so as to restrain the return of plethora, more frequently constitute all that is requisite to re-establish sound health. But when the debility is such as to require the use of tonics, he recommends the ammoniated tincture of iron in conjunction with the compound aloetic powder and soap; or a *corrective* tonic, composed of a combination of columba, cascarilla, and rhubarb, with carbonate of soda. As an alterative, he prefers the pilula hydrargyri submuriatis composita, in a dose of five grains every other night, to the blue pill; and when œdema and weakness are considerable after the perfect removal of the inflammation, he considers the use of a flannel or calico roller "of essential importance; combined with tepid sponging and friction, either with the dry hand or the flesh brush, or assisted with a stimulant liniment."

In illustration of the principles of practice, the sketch of which we have just concluded, nine cases are detailed. In all these the symptoms are accurately and fully described; and the practice adopted displays considerable judgment, and a mind well adapted for seizing those circumstances in the train constituting the disease, the removal of which are the most likely to pave the way to returning health.

The next object of Dr. Scudamore's inquiries, is "the

means of preventing the return of gout, or *the prophylactic regimen;*" which he examines under three heads, or "what relates to the general management, diet, and the occasional use of medicine."

Under the first head he observes, that in the choice of residence, "a gravelly soil in a middling level, protected from the north and the east wind, should be selected." As to clothing, flannel should be worn next the skin, at least eight months of the year; the feet in particular should be kept warm; but at the same time *hot covering* is justly deprecated. Cold bathing he regards as of doubtful efficacy, but recommends a bath of the Buxton temperature; adding,

"From well established experience I can confidently advise, as equally safe and useful, the following daily practice, of which indeed, although I have already spoken, I shall now dwell more at length: sponge every morning the whole of the feet, between the toes, all round the ankle joints (and the knee joints also, if they have been the seat of the complaint), with salt water, or water in which salt is dissolved, in the proportion of a table spooonful of salt to a pint of water; care being taken, that the *chill* of the fluid be always just removed by the addition of a sufficient proportion of warm water.

"The skin being wiped perfectly dry, diligent hand rubbing (the best kind of flesh brush) should be employed for as long a time as is convenient; and should invariably be continued, until a sensible glow of the skin is produced. In the whole process, one part should be finished before another is begun, lest evaporation should take place from the moistened surface in an unfavourable degree."—pp. 244, 245.

The importance of both horse and foot exercise in the country; of regular hours of rest, the daily quantity of which should not exceed eight hours; of cheerfulness and serenity of mind; and of a moderate exertion only of the intellectual faculties, avoiding severe study; is pointed out and ably enforced.

With regard to diet, Dr. Scudamore thinks the "rule of abstinence has been too much insisted upon for the gouty, and that little is often performed, because too much is required."

Experience of what agrees with the habit must determine the quality of the food which is to be preferred; but error in quantity must be rigidly avoided. Animal food should be eaten once only in the day, and cooked in the simplest form, as the niceties of cookery not only provoke to a larger meal than is proper, but the stomach also becomes over excited "by the varied nature of the stimuli." The details on this part of the subject are correct and sufficiently minute; but we fear the advice of the Physician, like that of the Moralist, will continue to make but an evanescent impression, when opposed by the enjoyments of the festive board, the allurements of luxurious indolence, and the various fascinations of sensual gratification; since even the severe remonstrances of frequently renewed pain fail to admonish those, who, in the lapses of their sufferings, exclaim with the poet, "Vitam faciunt Balnea, Vina, Venus."

Among the various articles of animal nutriment, our author justly prefers that which has little fat and the greatest share of muscular fibre, as it is this part "that affords the best stimulus to the stomach, and the most favourable material for digestion." We were amused with the following piece of information, which is quite new to us:

"I learn, however, from good authority, that pork broth (quite free from fat) agrees remarkably well with very weak stomachs."—p. 256.

Salmon is stated to be the most unwholesome fish, and next to it is mackarel. Shell fish, also, is said to be hurtful; but we must refer our readers to the work itself for further particulars regarding injurious articles of food.

We accord with the opinion of Dr. Scudamore, that although fermented liquors are to be condemned, yet that the very habits which produce gout, occasion a state of stomach in the gouty, which renders "the moderate use of wine both useful and necessary;" but we must dissent from the remark, that "in determining the exact quantity most favourable to the patient, a careful attention to his own feelings will be a sufficient guide; the object being this, that the wine should produce a feeling of comfort, without any sensible heating excitement."—p. 260.

It would indeed be difficult to conjecture what some men would consider "a feeling of comfort," in this respect.

The prophylactic medicines are chiefly warm aloetic purgatives, alkalies, and alkaline earths; the latter of which our author regards as useful, only inasmuch as they serve "to amend any wrong process in the secreting action of the kidney." He adds some judicious observations on tonics; and concludes the part of his work which refers to *Acute Gout*, by the detail of some experiments made by Mr. Astley Cooper on digestion, which were related in his lectures delivered two years ago at the Royal College of Surgeons.

Having finished the consideration of acute gout, Dr. Scudamore enters upon that "*of Chronic Gout.*" This form of the disease, we are informed, although seldom, yet occasionally occurs "in subjects in whom the acute form has never existed." It is more frequent "among women than men;" and, instead of the great toe, the seat of the swelling and pain is "the hand or wrist, or instep, and about the ankle;" but when it occurs as a sequela of acute gout, the parts originally inflamed "continue affected alternately or in conjunction." The redness, if any, is paler and more transient than in acute gout; and the bursæ and tendons are the parts most affected. The dyspeptic and hypochondriacal symptoms are very severe, being frequently attended with a chronic cough, always with great irritability of temper; and in the worst instances, a general *cachexy* takes place; all "the secretions becoming more or less vitiated; and the excretions irregular." In this state of the frame, any internal disease which is casually produced, assumes a modification more or less remarkable, in consequence of the gouty diathesis, an occurrence very apt to confuse and perplex the practitioner.

With regard to the causes of chronic gout, as it is merely a modification of acute gout, our author is of opinion, "that the difference in the agency of the remote causes" depends on the particular state of the constitution; languor and debility prevailing when the chronic form arises. A first attack of gout seldom assumes the chronic form, unless in advanced life, when there is a plethoric state of the system, joined with much debility; or in females of weak constitutions heredita-

rily predisposed. Dr. Scudamore conceives that the *eau medicinale* "has been the fruitful source of many cases of chronic gout."

In forming a *diagnosis*, the disease from which chronic gout is most difficult to be distinguished, is chronic rheumatism. The characteristics on which our author chiefly relies, are the greater derangement of the natural functions, and the greater degree of œdematous swelling when the foot or hand is affected in chronic gout. He conceives that although "the general disorder may often partake of rheumatism," and the two diseases may exist "in different parts of the body at the same time," yet that the gouty and rheumatic inflammation cannot exist in *the same part*. Chronic gout is more easily distinguished from nodosity of the joints.

In discussing the treatment of chronic gout, Dr. Scudamore arranges his subject under three distinct heads: The *first*, which supposes a debilitated constitution unequal to the production of an acute fit of gout, requires that "our indications be chiefly derived from the state of the chylopoetic viscera," and of the secretions. The remedies recommended are purgatives and soothing narcotics at bed-time; such, for example, as "five or seven grains of Dover's powder, or three quarters of a grain of opium, with a grain of antimonial powder;" or if the surface be not heated, the black drop, the effects of which our author has found in some instances "peculiarly satisfactory." The local treatment should be the same as in acute gout, with the after-addition of friction and a bandage. The other means consist of a combination of purgatives and tonics, such as are indicated in dyspepsia; but the use of simple tonics is judiciously advised to be postponed "until the secretions are rendered perfectly healthy." The *second* refers to that impaired state of constitution which is produced by repeated invasions of acute gout, and in which "the chronic diseased action alone can take place." In this state we are told, the purgative plan requires to be longer continued, the state of the secretions being the guide; and afterwards the tonic mode of treatment pursued. Local congestions, which were likely to occur, should be relieved by cupping; and even when spasmodic or nervous symptoms require the use of ammonia or

æther, and similar palliatives, these remedies should be cautiously employed. In weakened habits, where gout is suspected, although it has not yet existed, it is too common to invite, as it were, a fit; a practice which Dr. Scudamore severely and justly reprobates.

"It is often hurtful," he adds, "and sometimes hazardous, to excite a weakened circulation into strong action; and it cannot be denied that the active means which are thus injudiciously adopted to urge the gout, may produce, instead of it, an apoplexy. I apprehend that the true method of treatment, on the occasions to which I have alluded, consists in a regular and persevering attention to the chylopoetic functions, both by means of medicine and regimen."—p. 298.

The *third* head treats of the mode of managing those local changes of structure arising out of repeated attacks of acute gout, and with which rheumatism is often blended. In these cases a narcotic and sudorific plan is recommended, with tepid bathing, particularly the Buxton bath. When contractions occur, Dr. Scudamore is of opinion, that friction, according to Mr. Grosvenor's plan, "constitutes the only remedial method which can reasonably promise success." If the lower extremities are affected with œdema, the support of a roller is absolutely necessary; with the addition of soap plaster spread on leather, where the bursal distensions are tender and painful; and this plan, in conjunction with frictions and sponging, is regarded by our author as even much more useful in gouty enlargements of the joints than repeated blistering. After giving the history of two cases of chronic gout, this part of the treatise is concluded "by a brief discussion of the treatment of *gouty concretions;*" in the early state of which, as an external application, Dr. Scudamore extols a "dilute solution of pure potass in almond emulsion," to be applied by means of friction two or three times a day; and as a constitutional remedy, a combination of magnesia and pure potass; but, as the Doctor admits, it is "very doubtful whether any medicine will be found to have a specific operation as chemical agents" on these concretions.

We have already entered so much into details, that we can do little more than notice a few of the leading points in the sec-

tion on *Retrocedent Gout.* The exciting cause of this form of the disease is correctly stated to be "sudden vicissitude of temperature applied to the body generally; or cold, more or less continued, offered to the affected parts." Hence the danger, in some constitutions, of the revived practice of applying cold water to the extremities during the paroxysm even of acute gout. Cullen, and others, have taught, "that debility and spasm, and not inflammatory action, seize the internal organ in the case of retrocedent gout:" our author maintains the opposite opinion, in which we fully concur. Agreeably to this opinion also, he opposes the usual stimulating mode of treatment; instead of which he recommends, if indigestible food be the cause of the retrocession, first, to clear the *primæ viæ*, both by vomiting and purging; and then, if violent pain still continues, to exhibit without hesitation from forty to eighty drops of tincture of opium; taking care that the re-action which may follow on its abatement, do not arise to inflammation. If exposure to cold, however, be the exciting cause, we are desired to abstract sixteen, twenty, or thirty ounces of blood from the arm, to treat the inflamed bowels as in ordinary enteritis, and to divert the diseased action again to the extremities, by sinapisms, warmth, and other topical stimulants; and should the brain be the part affected, the same means must be resorted to as in apoplexy. Three cases are detailed illustrative of this practice.

Dr. Scudamore concludes his treatise with some general, yet highly interesting observations on the diseases connected with the gouty diathesis; and on the safety and importance of a free use of the lancet as a remedy in gout. The remainder of the volume is filled up with an Essay on Rheumatism; but as the author offers it only as "the sketch of a brief and general outline" of a subject which he reserves for a future volume, we also shall reserve any observations we might feel disposed to make upon it, until it appears in a more finished form.

We must acknowledge, that the performance of our critical duties have seldom been productive of so much satisfaction, as we have received in drawing up our analysis of this volume: and we have little hesitation in affirming, that whether we

regard the matter generally, the arrangement, or the talent for useful practical observation which it displays, it is, in every respect, highly creditable to the author. It is undoubtedly the most scientific work on gout that has appeared in our time. With regard to the execution, as far as mere authorship is concerned, although we must allow that the language is in general correct and the style perspicuous, yet it is our duty to notice, that a few instances of inaccurate expression and bad taste occasionally caught our eye: such, for example, as the following indefinite sentence,—" a notice of many days or even longer," p. 18:—and " a mild gout took place," meaning a mild attack of gout, p. 21:—whilst in page 193 we find the following barbarous expression, " illy tolerates." Among the typographical errors, which are indeed few, we observe, in the table of first attacks, that the number occurring between fifty and sixty years of age is stated to be sixty instead of three. But these are very venial errors; and while we willingly admit that the texture of the garment is excellent, we may add, in the language of our old friend Horace,

" Non ego paucis offendar maculis."

Cases of Diseased Bladder and Testicle, illustrated with Etchings. By WILLIAM WADD, Surgeon. 4to. pp. 72. London, 1815.

[From the London Medical Repository, for October, 1816.]

THIS is not the first time that Mr. Wadd has appeared before the public as a writer on subjects connected with his profession. The present performance, however, principally claims our attention for the novelty of its illustration; the plates being wholly executed by the author, some of which are admirable specimens of the effect capable of being produced by the etching-needle; and as they all bear the date of the same year, they must be considered as very creditable proofs of industry and talent. The intention of the author will be best explained by the preface:

"The study of Surgery has been greatly facilitated by the introduction of Engravings to illustrate morbid changes. Preparations, wet or dry, however beautifully executed, are, from the time of their completion, gradually losing their value, by loss of colour, change of figure, and even from the very delicacy of their materials. Add to this, their utility is much lessened by the circumscribed spot, in which only they can be examined. In the circle of the theatre they relieve the lecturer, but arrive at many of the hearers, when the subject for which they were introduced is passed, and from that period can be only imperfectly recollected, if they are not entirely forgotten. Engravings, on the contrary, may be multiplied to any number; and whilst morbid preparations require a constant interpreter, these are always accompanied with minute explanatory references.

"It must however be admitted, that inaccuracy in the figure, or reference, may be productive of errors, of which the common artist, taught only to study effect, is a very imperfect judge. Hence the difficulty of procuring satisfactory anatomical representations, even from the ablest masters.

"The early habit of pencilling morbid appearances, of sufficient interest to deserve notice, has by degrees furnished the author with a large collection of drawings. Of these, when, in compliance with the wishes of his medical friends, he has been desirous of offering to the public a selection of the most interesting, he has always been discouraged by the difficulties above mentioned. On this subject he had frequent conversations with his friend Mr. Hills, whose philosophical pursuits and pre-eminent talents as an artist are well known. This gentleman not only advised the author to undertake what it would be difficult to explain, or correct in others, but as a further encouragement, offered his own instructions, to enable him at once to secure and multiply the productions of his pencil, by means of the etching needle. Such a proposal, from one who, unrivalled in the peculiar department of his art, has, in the execution of a work representing the character of living animals, surpassed the productions of this or any other country, was eagerly adopted, and may serve as an apology for the attempt."—p. vii, viii.

The first part contains nine plates, exhibiting the morbid appearance of diseased bladder and prostate, each plate being accompanied with a short history of the case during life. It commences with specimens of calculi in the ducts and substance of the prostate gland. In these cases small portions of gravel had been passed; there was constant irritation above the neck of the bladder that admitted of no alleviation, nor could the catheter be introduced.

Next we have enlargements and ulcerations of the prostate, in some instances with thickening of the muscular coats of the bladder, the internal membrane forming sacculi containing small stones; and also a case where an uncommon thickening and contraction of the bladder arose from strictures in the urethra. A case is likewise related, where a life of abandoned profligacy was terminated by a frightful specimen of disease. A mass of malignant fungus covered the whole nates; while in the perinæum, scrotum, and groin, numerous fistulæ were formed, through which the urine passed in all directions. The plate of urinary calculi is very interesting, as it exhibits an outline of two of the largest ever known to have been found in the human bladder in this country. A case is also detailed, where a small calculus was extracted from the urethra by an incision in the perinæum.

In the illustration of the fifth plate, the author takes an opportunity of enlarging on the utility and importance of injecting the bladder, which he regrets is not more frequently resorted to, as he never saw it once applied during many years' attendance at St. Bartholomew's Hospital: and he has seen many instances in which he believes "life could not have been sustained without it." His experience certainly bears very favourable testimony to its beneficial effects. On the subject of puncturing the bladder, he decides for puncturing through the rectum, which seems, indeed, to be the mode now generally adopted by practitioners.

The second part of the work relates to diseases of the testicle, the successful treatment of which illustrates very satisfactorily the opinions of the late Mr. Ramsden. Plate 14 exhibits the section of a testicle enlarged and indurated with a fungus arising from the body of the glandular substance. This

seemed to originate from hernia humoralis, which was produced by the imprudent injection of a solution of the sulphate of zinc, and was also connected with strictures and an irritable urethra. By the use of efficient means for the removal of the latter symptoms, the testicle was speedily reduced in size; but before the part was in a state to admit of caustic being applied to the fungus, the patient died from pulmonary hæmorrhage.

The chapter on hydrocele contains much practical information; and the author very opportunely pays a just tribute to the fame of his master, Sir James Earle, for the introduction of "one of the most perfect operations in surgery;" viz. the cure of hydrocele by injection.

"Whilst I had the honour of visiting with Sir James Earle, there was scarcely an operation of any kind performed by him, at which I was not present; and as to Sir James we owe the fortunate revival of this important operation, with its present improvement, it will be supposed that the cure of the hydrocele by the injecting the tunica vaginalis testis, made a very considerable part of his practice, and gave me an opportunity of seeing it under every form. In some cases after caustic, seton, incision, external applications, and other operations have failed, and even where the injection had been previously tried by others less acquainted with the practice, he was fortunate enough to succeed.

"The only instances of failure were two cases, in which an attempt was made at a further improvement in the operation; and a third wherein no irritation was produced, in consequence, as it was supposed at the time, of the servants having diluted the wine. Each of these were cured by a second operation shortly afterwards. Whether even this was necessary cannot now be ascertained, but it is by no means certain.

"'The proper object,' says Sir James Earle, 'of all operations for the radical cure of the hydrocele, is to produce such an adhesion of the distended vaginal coat of the testis with the gland, or such a consolidation of contiguous parts, as shall annihilate the cavity, in which the water constituting this disease is contained.' The same is Mr. Pott's language. 'The cure is accomplished merely by the coalescence of the tunica

vaginalis with the tunica albuginea;' and Mr. Sharp, in his Critical Enquiry, tells us, that, 'upon examination of several hydroceles after cure, it appeared evidently it was wrought by an universal adhesion of the testicle to the tunica vaginalis.' Such, I believe, were the sentiments of every surgeon of eminence, till Mr. Ramsden ventured to dissent from the established doctrine; asserting that the obliteration of the cavity of the tunica vaginalis testis was not essential to the cure, and that it did not happen unless the curative process had been carried to unnecessary severity.

"Among my notes, is a memorandum which very much confirms Mr. Ramsden's opinions. A gentleman underwent the operation in May 1799. He left town at the end of June. The beginning of July he stated by letter that the hydrocele had returned as large as before the operation; and in the middle of the next month, he wrote word that it had entirely disappeared. The operation had therefore excited a new action in the parts, and though the effusion of fluid had returned, yet the absorbents had recovered their function.

"That adhesion takes place between the tunica vaginalis and testis, where there has been a certain degree of inflammation, has been repeatedly demonstrated; and that it is the general effect of the usual mode of injection; but if the cure can be accomplished by less irritation, and without any change in the parts from their original formation, many might be inclined to undergo it, who would not be willing to hazard an operation under any other circumstances.

"Mr. Ramsden has not confirmed his theory by dissection; but brings abundant proof of transparency in the scrotum after the operation, and on that fact its validity chiefly rests. He attached great importance to the ascertaining the transparency of hydrocele, and in all cases made it his first object of inquiry, thinking that the surgeon who neglected this 'grand characteristic,' gratified his vanity at the risk of his patient's security.

"The usual injection is two parts wine to one of water; or if the tunics are thin, the testicle enlarged, or any circumstance requiring caution, it is made of equal parts, wine and

water. Even the latter proportion is sometimes productive of considerable pain and tumefaction.

"With a view of following Mr. Ramsden's plan of curing by only exciting a new action, with as little pain as possible, I have so lessened the quantity of wine, that the irritation produced has been such as not to detain the patient at home, after the day on which it was used; and I am inclined to think that very little irritation of the sacculus is sufficient for the cure of most hydroceles, that do not exceed half a pint in the quantity of fluid, nor six months from their first appearance."—p. 48—52.

In the conclusion Mr. Wadd gives two very excellent specimens of the hernia congenita, and describes somewhat at large the peculiarities of the testicle.

This work must be considered as a valuable record of important facts and observations relative to a class of diseases that are "among the most distressing of those which do not necessarily shorten life." The practice of taking sketches of morbid parts, and registering facts connected therewith, ought to be assiduously cultivated by all who are desirous of contributing to the advancement of surgical knowledge. Were this more frequently resorted to, a mass of valuable data would be accumulated, that might hereafter serve, when digested and methodized, to throw light upon some of those obscure cases that in every practice must occasionally occur. We cannot but applaud Mr. Wadd's very commendable attention to this important point, and we hope at some future time to see more of the contents of his port-folio and memorandum book.

ORIGINAL PAPERS.

Three Cases of Extirpation of diseased Ovaria.

By EPHRAIM M'DOWELL, M. D. of Danville, Kentucky.

In December 1809, I was called to see a Mrs. Crawford, who had for several months thought herself pregnant. She was affected with pains similar to labour pains, from which she could find no relief. So strong was the presumption of her being in the last stage of pregnancy, that two physicians, who were consulted on her case, requested my aid in delivering her. The abdomen was considerably enlarged, and had the appearance of pregnancy, though the inclination of the tumor was to one side, admitting of an easy removal to the other. Upon examination, per vaginam, I found nothing in the uterus; which induced the conclusion that it must be an enlarged ovarium. Having never seen so large a substance extracted, nor heard of an attempt, or success attending any operation, such as this required, I gave to the unhappy woman information of her dangerous situation. She appeared willing to undergo an experiment, which I promised to perform if she would come to Danville, (the town where I live) a distance of sixty miles from her place of residence. This appeared almost impracticable by any, even the most favourable conveyance, though she performed the journey in a few days on horseback. With the assistance of my nephew and colleague, James M'Dowell, M.D., I commenced the operation, which was concluded as follows: Having placed her on a table of the ordinary height, on her back, and removed all her dressing which might in any way impede the operation, I made an incision about three inches from the musculus rectus abdominis, on the left side, continuing the same nine inches in length, parallel with the fibres of the above named muscle, extending

into the cavity of the abdomen, the parietes of which were a good deal contused, which we ascribed to the resting of the tumor on the horn of the saddle during her journey. The tumor then appeared full in view, but was so large that we could not take it away entire. We put a strong ligature around the fallopian tube near to the uterus; we then cut open the tumor, which was the ovarium and fimbrious part of the fallopian tube very much enlarged. We took out fifteen pounds of a dirty, gelatinous looking substance. After which we cut through the fallopian tube, and extracted the sack, which weighed seven pounds and one half. As soon as the external opening was made, the intestines rushed out upon the table; and so completely was the abdomen filled by the tumor, that they could not be replaced during the operation, which was terminated in about twenty-five minutes. We then turned her upon her left side, so as to permit the blood to escape; after which, we closed the external opening with the interrupted suture, leaving out, at the lower end of the incision, the ligature which surrounded the fallopian tube. Between every two stitches we put a strip of adhesive plaster, which, by keeping the parts in contact, hastened the healing of the incision. We then applied the usual dressings, put her to bed, and prescribed a strict observance of the antiphlogistic regimen. In five days I visited her, and much to my astonishment found her engaged in making up her bed. I gave her particular caution for the future; and in twenty-five days, she returned home as she came, in good health, which she continues to enjoy.

Since the above case, I was called to a negro woman, who had a hard and very painful tumor in the abdomen. I gave her mercury for three or four months with some abatement of pain; but she was still unable to perform her usual duties. As the tumor was fixed and immoveable, I did not advise an operation; though from the earnest solicitation of her master, and her own distressful condition, I agreed to the experiment. I had her placed upon a table, laid her side open as in the above case; put my hand in, found the ovarium very much enlarged, painful to the touch, and firmly adhering to the vesica urinaria and fundus uteri. To extract I thought would be instantly fatal; but by way of experiment I plunged the scalpel into

the diseased part. Such gelatinous substance as in the above case, with a profusion of blood, rushed to the external opening, and I conveyed it off by placing my hand under the tumor, and suffering the discharge to take place over it. Notwithstanding my great care, a quart or more of blood escaped into the abdomen. After the hemorrhage ceased, I took out as clearly as possible the blood, in which the bowels were completely enveloped. Though I considered the case as nearly hopeless, I advised the same dressings, and the same regimen as in the above case. She has entirely recovered from all pain, and pursues her ordinary occupations.

In May 1816, a negro woman was brought to me from a distance. I found the ovarium much enlarged, and as it could be easily moved from side to side, I advised the extraction of it. As it adhered to the left side, I changed my place of opening to the linea alba. I began the incision, in company with my partner and colleague Dr. William Coffer, an inch below the umbilicus, and extended it to within an inch of the os pubis. I then put a ligature around the fallopian tube and endeavored to turn out the tumor, but could not. I then cut to the right of the umbilicus, and above it two inches, turned out a scirrhous ovarium, (weighing six pounds) and cut it off close to the ligature, put round the fallopian tube. I then closed the external opening, as in the former cases; and she complaining of cold and chilliness, I put her to bed prior to dressing her—then gave her a wine glass full of cherry bounce, and thirty drops of laudanum, which soon restoring her warmth, she was dressed as usual. She was well in two weeks, though the ligature could not be released for five weeks; at the end of which time the cord was taken away; and she now, without complaint, officiates in the laborious occupation of cook to a large family.

On the Use of Alkaline Caustic in Tetanus.

By JOSEPH HARTSHORNE, M. D.

In August 1814, a man affected with tetanus, induced by a wound of the knee joint, became my patient in the Pennsylvania Hospital. Large doses of opium had been given by the physicians, who attended him before his admission. The use of opium was continued—Æther, brandy, ext. of stramonium, calomel, in large doses, were also exhibited; and after covering the wound with adhesive plaster, a large blister was applied to the knee. These remedies afforded a temporary relief; but the spasms soon after became so violent, particularly in the muscles of the glottis, as to threaten the instantaneous destruction of life. Under these circumstances, I determined to apply the alkaline caustic over the cervical vertebræ, with a view of influencing the muscular system, through the medium of the spinal marrow. In less than two hours after this application, a diminution of all the symptoms of tetanus took place. After a painful confinement of 5 or 6 months, in consequence of inflammation of the knee joint, the man entirely recovered.

As my experience in the use of this remedy in tetanus, is very limited, I would feel more hesitation in recommending it, if the proofs of its efficacy depended solely on the few cases, which have fallen under my immediate notice. I have the pleasure of offering as additional evidence in its favour, the following extract of a letter from Dr. Tristram Thomas, an eminent practitioner in Easton, Maryland, to my friend Doctor John W. Moore, of this city.

"*Easton*, *27th Oct.* 1816.

"I have long intended to communicate the result of the application of the caustic alkali, suggested by you, in the case of a tetanic patient I had under my care, when you were last in Easton, (Aug. 1816.)

"All the remedies usually recommended in tetanus were

employed in their full extent. Sixty drops of laudanum every two hours, Madeira wine, mercurial ointment, &c. were all jointly used. These remedies made no impression on the disease, which was evidently gaining ground. On the 4th day, I made the application of the caustic alkali to the cervical vertebræ; I rubbed it pretty firmly for a few minutes in an oval form, about two and a half inches in length, and one and a half in breadth. The patient complained of great heat and burning, as if coals were applied to the part. I covered the eschar with a pledget of soft ointment, and ordered her to bed; she had previously taken 80 drops of laudanum. The effect was really delightful; the new action excited by the alkali, destroyed completely the morbid action in the system—the spasms instantly ceased, and in one hour, she appeared free from disease; she could open her mouth, and deglutition became free and easy. She was soon up and able to attend in some degree to her business, and never after complained of pain or uneasiness, except from the issue, which remained for several weeks very sore."

Case of Gun-shot Wound, where a musket ball was lodged in the posterior part of the neck, and subsequently discharged per Anum. Communicated by Dr. WM. H. HENING, late Surgeon in the army of the U. States.

IN the campaign of 1814, a strong detachment of the British army having crossed the Niagara river, moved towards Buffalo, with the intention of destroying the stores deposited at that place, for the use of the American army, then at Fort Erie, on the Canadian side. Anticipating the designs of the enemy, he was met by a detachment of the 1st Regiment of Riflemen, under the command of the late gallant and much to be lamented Major L. Morgan, on the banks of the Conjockita creek, where an action ensued, highly creditable to the prowess of our arms. In this action, Lt. ———, a gallant young officer, while in the act of conveying an order, received a wound from a musket ball in his neck. It entered on the right side, nearly

on a line, and midway between the angle of the lower jaw, and the middle of the cervical vertebra, passing from before, backwards. Ineffectual attempts were made to discover the ball with the probe. The right arm became extremely painful and finally paralytic. Deglutition was attended with much uneasiness, and could only be performed in an upright position. The wound terminated in a fistulous opening, discharging considerable quantities of pus, and occasionally spiculæ of bone. Distressing cough and violent paroxysms of pain in the neck and arm harassed the suffering patient. Obstinate constipation and pain in the bowels, was not among the least of his sufferings. As it could not be determined where the ball had lodged, and as the delicate, and important parts concerned, precluded the idea of searching for it, little more was done, than by palliatives, to mitigate some of the more distressing symptoms. This state of things continued for four or five months, with little or no material alteration; when, to the very great gratification of the patient, and no less to my surprise, the ball was discharged by stool, while under the operation of a cathartic which had been ordered to open the bowels. It was much flattened, which no doubt had been produced by its striking the vertebra of the neck. In this case, may not the ball have lodged between the upper and posterior part of the pharynx, and the bodies of the cervical vertebræ, and have made its way by ulceration, into the œsophagus, to the stomach? May not the pain, and constipation of the bowels have been produced, by the oxydation of the surface of the ball, and the oxyde of lead passing into the stomach, either with the food or saliva? From this time he recovered gradually, left the frontiers, and I have since been informed, has entirely recovered from the effects of his wound.

A Case of Aneurism with Singular Appearances.

By SAMUEL JACKSON, M. D. of Northumberland.

DEAR SIR,

IF the following case should appear to you less interesting than I have considered it, I hope you will excuse the trouble I am about to give you.

On the 23d, of January, I was requested by Dr. Dougal of Milton, to visit with him John Kelly, who was labouring under a disease of difficult diagnosis.

There was a large swelling in the right ham, reaching two thirds round the thigh, and extending upwards more than half its length, very tense, hard and painful. If there was any fluctuation, it was hardly perceptible. The knee was bent, and could not be extended; the calf of the leg enlarged, and very hard.

The patient, about twelve months before, had first observed two oblong swellings, one in the course of each hamstring, which were painful, and increased slowly until they coalesced. The general tumour then enlarged rapidly, and became extremely painful.

About ten years ago this leg was fractured below the knee, but was soon healed by the care of Dr. Dougal, and to all appearance completely restored. Some time afterwards a severe pain attacked the foot, unattended by fever or any apparent inflammation. Dr. Dougal exhausted his skill upon this complaint without effect, and afterwards all the practitioners in the neighbourhood were tried, but no relief was obtained. It however gradually subsided, and was probably relieved by the complaint we have been describing.

We were now to consider the case, and learn if possible the nature of the complaint, whether it was an aneurism or a collection of water or pus. There was no pulsation in the tumour, and the patient assured us there never had been; the pulse in the instep beat with entire regularity, as also at the wrist, without imparting any peculiar sensation to the fingers; and

we did not find any thing like aneurismal tumours in other parts of the body.

In this embarrassment we determined to make a valvular opening in the sac, with a small lancet, and ascertain the nature of the contained matter; if it proved to be pus or water, to let out a proper portion of it and heal the wound by the first intention; if blood, to perform the customary operation for aneurism.

The patient was placed on a table and the necessary instruments prepared for both operations. The puncture was made, and we had the pleasure of seeing it followed by a stream of turbid water. After running about three pints, it suddenly ceased; a probe was introduced and a little bloody water followed; a small injection pipe was next tried, which, to our great disappointment, brought away a full stream of blood.

The case was now plain, we had no doubt of its being an aneurism. The puncture, therefore, being secured by adhesive plaster, the artery was tied with ligatures and divided between them according to the practice of Mr. Abernethy.

The patient seemed to suffer less after, than before the operation; which was probably owing to the tension of the tumour being removed by the evacuation of water. We had, however, very slender hopes of his recovery. He was forty-four years of age, very much emaciated, with a constitution broken by intemperance. It was therefore, only the hope of finding the tumour filled with lymph or pus, that induced us to perform any operation.

The pulsation in the tibial artery never returned. The incision in the thigh, refusing to heal, suppurated very freely. Tonics and stimulants were used, but to no purpose. He gradually sunk, the leg became livid about the seventh day, and on the tenth he died.

The sac was found on dissection to be smooth and shining on the outside; on the inside roughly granulated, a .d filled with a substance which appeared to be a mixture of putrid pus and blood. And here it must be observed, that the tumour was in a state of inflammation, when the puncture was made, and would certainly have ulcerated in a short time.

Both the artery and vein were traced into the sac about

the middle of the thigh; it then passed upwards parallel with these vessels as high as the pelvis. The popliteal artery and vein, both communicated with it below. This artery was found closed and converted into a solid cord. The femoral vessels were found in a healthy state quite down to the sac.

The ligatures had been made according to the directions of Dr. Jones, and tied with great firmness; but it was found that no adhesion had taken place and that the inner coat of the artery had not been cut. The sac was taken out almost entire, but the disease was too far advanced to afford any argument either for or against the doctrine of Scarpa. But the most interesting circumstance remains to be mentioned.

Upon washing the sac, several small pieces of charcoal were found adhering to its inner surface. Some of them were as large as a chesnut, but probably most of them were lost, as the fetid contents of the sac were thrown into cold water and carried away without examination; for it was only at the second washing that this curious substance was found. At first I suspected that charcoal had been brought in with the water, but I was soon convinced of the contrary by the firmness with which some of the pieces adhered.

We have made no attempt to analyse this substance. It has all the characters of charcoal, and probably its origin may be ascertained, as the venous and arterial blood were continually mixing in the sac, each loaded with the different principles of that compound body.

I had hoped to have the pleasure of sending you a specimen, but Dr. Dougal informs me that he has sent the whole of it to Dr. Wistar, through the medium of his son, who is now attending your lectures.

I am well aware that some further observations might have been made on this case, but the patient was eight miles from Dr. Dougal, and twenty from myself, and therefore it was difficult for us to do more than merely perform our duty.

I cannot conclude this account of what has appeared to us an interesting and extraordinary case, without making some apology for the trouble I have given you, should it not be worthy the attention I have claimed for it. Situated in a populous city, you have many opportunities of observation, which en-

tirely escape the village practitioner, whilst your learning and abilities have placed you in that enviable station, so well described by Lucretius, from which you often behold us wandering in darkness, which the light of your happy experience might dissipate.

"Sed nil dulcius est benè quàm munita tenere
Edita doctrinâ sapientum templa serena;
Despicere unde queas alios, passimque videre
Errare, atque viam palanteis quærere vitæ.

I am, your affectionate and
obedient humble servant,
SAMUEL JACKSON.

Northumberland, March 6, 1817.
Dr. J. S. Dorsey.

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*An attempt to point out a new, and successful Method of treating Mania à Temulentia.** By Joseph Klapp, M. D., one of the Physicians of the Philadelphia Alms-House.

"I have always thought it a greater happiness to discover a certain method of curing, even the slightest disease, than to accumulate the largest fortune; and whoever compasses the former, I esteem him, not only happier, but wiser, and better too."—Sydenham.

Having many times remarked that the subjects of mania, in consequence of strong drink, are very apt to labour under a vomiting for several days before they become deranged, and that when the mental disease begins, the vomiting ceases; and having also observed if puking, spontaneously, or accidentally occurs, while a person is affected with this spe-

* When on the subject of amentia, I perceive that Sauvages applies to that kind of mental imbecility occasioned by ardent liquors, the very appropriate Latin expression of amentia à temulentia; I have conceived that "à temulentia" connected with "mania" would form a better epithet, than "mania a potu," the phrase in common use in this city to express insanity from drunkenness. The first will signify the whole cause of the disease; whereas the latter merely implies madness from drink without identifying the kind of drink.

cies of insanity, a period is shortly put to the disease. By these observations I was very readily led into the following reasoning. If spontaneous puking will prevent for several days, and even is able to cure mania of this kind, why would not the administration of suitable emetics produce similar good effects. In thus practising, would I not have a right to claim that encouragement which is derivable from a supposition that I was imitating nature, or treading in her footsteps.

To show how far this method of reasoning will accord with experience, the following cases are respectfully submitted.

Case I.

The first case I shall relate is that of A. B. a man fifty years of age, keeps a tippling shop, and has himself long been in the habit of the most liberal devotions to Bacchus. On the 17th of August, at one o'clock in the afternoon, I paid him a visit for the first time, when he was found in a state of considerable mental derangement. The history which was given of the origin and progress of his disease, is as follows. At first he was seized with a vomiting and purging, which continued more or less for four days, then ceased entirely: on the fifth day he became insane, and in this state he had continued three days to the time of my visiting him. During the whole time of his insanity he had slept none. In his case there was less of the subsultus, or tremor of the limbs, than is commonly remarked in this disease, but his delirious opinions appeared deeply impressed, and were advanced with a manner the most confident. When he was requested to disclose the circumstances which were disturbing his mind, he commenced by prefacing his narrative with a declaration made in the most emphatic manner, that what he had to state, he not merely knew to be true, but that he should conceive it to be his duty to prove it to be so. On my making a profession of the fullest confidence in his veracity, he appeared satisfied, and proceeded with his statement; but evidently actuated by that hurry of manner and rapidity of speech, the familiar characteristics of the lunatic. When his improbable, and very minute story was told, it was easy to observe, that his mind was deranged in

two of its operations. He perceived a number of objects then present which were not, and he judged that his house-keeper had been guilty of certain transactions of which she was quite innocent. The pulse was weak, and yielded one hundred and twenty pulsations in a minute. I prescribed half an ounce of the following solution, to be given every fifteen minutes, until full vomiting was produced.

℞ Tartrit. Antimonii, vulgo Tart. emetic. gr. xxiv.
Solve in aquæ calidæ unc. vj.—ft. solut.

At six o'clock in the evening I again visited him, when I was informed, that after four doses of the medicine had been given vomiting had ensued, and a great quantity of tough, viscid mucus and biliary matters were thrown up from the stomach; almost immediately after which he fell into a deep sleep, and did not awake for two hours and three quarters; then he had an occasion to rise to evacuate his bowels, at which time the family assured me he seemed rational. After being removed from the close-stool to the bed, he again went to sleep, and I left him in that state.

18th. At two o'clock P. M. I found him awake; previous however, to my entering his chamber, the house-keeper informed me, that ever since the operation of the emetic was over, he had generally been asleep, and that during the whole of the forepart of this day he had slept soundly. The tartarized antimony, as I have been accustomed to observe in the treatment of other cases of this disease, purged several times. The pulse was reduced in frequency to one hundred in a minute, and had become fuller. In the course of conversation with him, I hinted at the perturbated state his mind had been in during the last few days; he quickly made answer that he knew it well, and that he had a perfect recollection of every thing that had passed. To ascertain more fully what condition his memory had been in during his derangement, I asked him to relate to me the impressions which his mind had laboured under. Accordingly, he stated with accuracy and good sense every thing which he had communicated to me the day before, the reality of which, as I have before stated, he then pledged himself to prove; the whole of which, to make use of his own expression, he was now satisfied was nothing but a

phantom of the brain. In short my patient was in his perfect senses, and the operation of the antimony had left me nothing to do but to prescribe for debility.

19th. This day was spent in bed, and in sleep.

20th. The soporific effect which the antimony had occasioned, appeared to be subsiding, the mind proved quite sane, and the patient requested to have something to eat. I permitted him to have panado, or gruel, containing a small quantity of brandy, and weak wine and water for drink.

21st. My directions concerning diet had not been strictly adhered to: the patient had been very indiscreetly permitted to dine yesterday on rail; in the course of the afternoon I was informed he had complained of a sense of heaviness, and of some pain in the region of the stomach, and back; last night slight aberrations of the mind had again been noticed, and his rest had not been so comfortable. Suspecting that the stimulus of his yesterday's dinner had occasioned these symptoms, I desired the emetic solution to be repeated as before ordered.

22d. The medicine had operated freely after giving the third dose; the uneasy feelings about the stomach from that time ceased, and he slept comfortably through the night.

23d. The patient was found walking about the house in every respect apparently well, and I concluded that further attendance was not necessary.

Case II.

On the 16th of August I was requested to see Mr. C——, a grocer; he is about 40 years of age, and has long been an intemperate man. I had several times before seen him in a state of derangement, but at this time his insanity was more violent than it had ever been. He had made two or three attempts to destroy himself, and the constant aid of several persons was required to keep him in proper subjection. The tremor of his hands and arms, and indeed of his whole frame, was so great as to make it almost impossible to ascertain his pulse; but as near as I could perceive it was very weak, and frequent. His wife stated, that during the last three days he had not slept more than fifteen minutes at any one time; she was desirous to have him removed either to the alms-house, or hospital,

but I prevailed on her first to try the effect of a little medicine. Accordingly two grains of tartris antimonii, were advised to be given every quarter of an hour till vomiting was excited. This visit was at six o'clock A. M. At half past 10 o'clock of the same morning I called again, and was informed that the medicine had operated briskly both on the stomach and bowels; after he had puked a few times he became sleepy, and on going into his chamber I perceived he was in a deep sleep. In the afternoon my visit was repeated, when I found him still asleep. Directed a little stimulating gruel to be given to him now and then through the night.

21st. The mental affection had entirely ceased, but the propensity to sleep still continued: permitted a small quantity of spirit and water to be drank during the day.

21st. At my visit of this day I met with the patient down stairs, and completely recovered both in body and mind. Attendance discontinued.

Case III.

Mrs. M. the subject of the next case, is twenty years of age, and for the last few years has been unfortunately addicted to the excessive use of strong drink. I have attended the family of this lady for several years, and have remarked for some time past in my visits at her house, that she has had a bloated appearance, swelled hands, and a trembling of the limbs. Her appetite I was told had been very indifferent. On the 14th of August, I was requested to visit her: when I arrived it was stated, that during the previous six or seven days, she had laboured under sickness of the stomach, and frequent vomiting. Liquids, and substances of every kind, almost immediately after swallowing them, produced nausea and puking. The pulse was weak, and afforded about seventy-five vibrations per minute.

Directed the gastric region to be covered with a strong mustard poultice; when it had occasioned as much pain as the patient could bear, to remove it, and to dress the inflamed parts with sweet oil. Then to begin, and give half an ounce of the following mixture every hour, until the stomach becomes composed.

℞ Succ. limonis, unc. i.
Sal. tart. q. s. ad saturat.
Aq. menth. pip. unc. iss.
Aq. comm. unc. iii.—ft. mixt.

To drink seltzer water freely.

15th. The remedies had succeeded. Complained of costiveness, and transient pains in the bowels. Prescribed an ounce of castor oil.

16th. The bowels had not been moved; in the course of last night she began to imagine that the room, and the bed in which she lay, contained birds, snakes, and different frightful animals. These morbid perceptions produced such strange, and incoherent behaviour, as convinced her friends of her having been seized with insanity. When I spoke to her relative to her conduct in the night, she made light of it, and wished to pass it over with a laugh; but when she perceived I would not be put off, she replied, that her behaviour of which her friends had complained to me, had been the effect of a disturbed imagination, that it had been a dream, and that she no longer saw, nor believed in such things. Directed one of the following powders to be given every three hours so as to purge freely, and to encourage their operation by drinking freely of warm molasses and water.

℞ Solub. tartar.
Pulv. jalap. āā. dr. i.
M. ft. chart. iii.

In about three hours subsequent to my last visit, word was left at my office, that Mrs. M. had become violently deranged. In the middle of the day I again visited her, and was told that the family had not been able to confine her to her room; that for some time she had been running about in great agitation of mind from room to room, and from house to house, in the neighbourhood, to escape from terrifying objects, which she persisted in asserting were constantly pursuing her. When I was able to meet with her, it was evident that she was in a state of complete mental derangement. By a misapprehension of the directions, the powder had been given every half hour, but without effect. Conceiving it very necessary to have the bowels opened, I still adhered to the use of the purgative

medicine, and directed a pint of strong senna and manna infusion to be given to her; should this not prove sufficient to have recourse to enemata. In the evening the medicine operated two or three times, without producing any alleviation of the mental disease. Prescribed two grains of tartarized antimony dissolved in a little warm water, to be given every fifteen minutes until brisk vomiting is induced.

17th. Was informed that twelve grains had been exhibited before puking had occurred; shortly after the operation was over, she sunk into a sound sleep, and at the time of this visit, which was ten o'clock in the morning, she had not yet awoke. At half past four P. M. I found her awake, and in the full, and perfect possession of all her mental faculties. Pulse seventy-six in a minute, soft, and regular. The antimony had also purged her freely. On perceiving with great pleasure that I had completely gained my point, I withdrew; merely ordering the chamber to be kept quiet, and to give to the patient occasionally some gruel, containing a small quantity of brandy.

18th. The patient was about the house, sound in both mind and body.

20th. Mrs. M. had rode out, and was told, that with the exception of a slight vertigo she had remained well.

Case IV.

On the evening of the 2d of October, G. was admitted a patient into the alms-house, for mental derangement of the furibund grade, and satisfactorily ascertained to have been occasioned by the excessive use of ardent spirits. He is a carpenter by occupation, is about 40 years of age, and on inquiry I was told that for many years he had been a very intemperate man. Mr. Thum, the senior house pupil, assured me, that at the time of his admission he was not only violently insane, but he appeared to be so upon every subject. To prevent injury to himself it was found necessary, in addition to the use of the straight waistcoat, to have him closely chained to the floor of his cell. His pulse was frequent, and weak, and the trembling of his limbs was very great. He took two grains of the tartris antimonii dissolved in a little warm water every fifteen minutes; vomiting was not created until after twenty grains

had been administered, when a large quantity of viscid mucus, and sordes were brought up, and afterwards the bowels were smartly purged. After the operation of the antimony was over, Mr. Thum found that the pulse had become less frequent, and fuller. The patient had some sleep during the latter part of the night.

3d. He seems much better; pulse is as after the emetic; speaks correctly on some subjects, but remains evidently deranged on others. On entering his cell we found him very curiously employed: he was pressing with both arms, and apparently with all his strength, against the wall. I requested an explanation of his conduct, but he refused to give me his reason for doing so. The cell keeper afterwards informed me, that during the whole morning he had been bearing against the wall, through a fear, as G. had stated to him, that unless it was held up, it would certainly fall upon him, and crush him to pieces. I directed the tartarized antimony to be repeated.

4th. When sixteen grains had been given, first vomiting, and then copious purging ensued. On examination the pulse proved to be one hundred, and weak; he is plainly more rational in both conversation, and behaviour; in short it was rather difficult to discover that there was any of the mental affection remaining. In the course, however, of my conversation with him, it was perceived that his intellectual faculties had not been perfectly reinstated. Prescribed blister plasters to the ancles.

5th. Out of the last twenty-four hours he has slept eighteen, and is still inclined to sleep. When questioned about sleeping so much, seems conscious of his indolence, and apologized for it, by saying that the narrow limits of his cell would not admit him to take exercise, so he thought he might as well sleep as not. The blisters had not yet been dressed. By the test of conversation he this day proved rational, upon every subject. The tremor of the limbs have totally ceased, pulse remains rather too frequent, but has more strength than at any time heretofore. Nothing prescribed but some light diet.

6th. As yesterday, on my entering the cell, G. was still very comfortably reposing in bed; stated that his sleep had been uninterrupted through the night, and asserted, that with the

exception of a little weakness, he now felt as well as he had ever done. The debility of which he complained, he jestingly attributed to the fatigue he had incurred by the great exertions which he had made in holding up the walls of his cell. I embraced this favourable opportunity of asking him why he had put himself to that unnecessary trouble; he replied, that it had originated out of a flighty impression of his being at that time employed in erecting the partition of a large house, which required holding to prevent it from falling, at which deranged belief he seemed now much diverted. The pulse was one hundred, and had acquired fulness. He speaks sensibly on every subject, and gave me the following very amusing history of the beginning and advancement of his insanity. He asserted that it had been coming on better than a month, as far as his recollection would serve him; his first deranged impression occurred to him at night, while in bed with a fellow workman. Two men, as he supposed, had procured for themselves long iron hooks, with which they pulled off him the bed clothes, but he grasped them with his hands and brought the coverings over him again; after which they were however again and again dragged off the bed; this irritated him, and in a violent passion he jumped up to take revenge on these audacious fellows, who had so repeatedly attempted to deprive him of his rest. At first he endeavoured to get hold of their persons, but they had the address and activity to elude his grasp; though, while pursuing them around the room, he was several times on the very point of securing them. In regard to the actual presence of these mischief workers, there seemed to be no deception; for he plainly saw them skipping and running in different directions to avoid him, and he was only amazed at their superior activity. At one time he was almost certain of having one of them, for he came so near to him, as to catch hold of his long iron hook, the instrument with which he had been disturbed while in bed; at length, being much wearied by this unsuccessful chase, as a last effort to be revenged, he stooped down and picked up a stone which he sent at them with great force, but they again contrived to escape injury by making a sudden spring around the corner of the room. He now returned to his bed, but in a

short time afterwards, his attention was a second time powerfully excited by a full band of music, which had suddenly commenced playing in the street immediately before the door; he arose, and on opening the window to look out, he was unexpectedly surprised by the sight of a most splendid edifice, which had just been erected in the street; the building possessed many ornaments; among the rest, it had an elegant dome, which was covered with stars of the most brilliant kind. After gazing with indescribable admiration for some time at this grand fabric, he perceived two persons having hold of hands, dancing round each other in the cupola; instantly he recognized them to be the two men above alluded to; they called to him, and invited him to come and join them; which he did, and after dancing with them a short time, they asked him to accompany them to the theatre; with this request he also complied. The farce which was to be acted, was called *the broken bridge;* they wished him to perform the part of the carpenter, to repair the bridge, but this he refused to do, which so much affronted them as to induce them to attack him, and beat him very severely. These strange adventures, G. states were acted over two or three succeeding nights, when he become so unmanageable as to make it necessary for his friends to have him placed in the lunatic department of the alms-house. Of the inconsistency of his past opinion and conduct, described in his curious recital, no one could be more sensible than himself, or diverted with its folly, Being in every respect well, the patient requested his discharge, but was prevailed on to delay his departure a day or two longer. Directed Mr. Thum to allow him a little spirit and water for drink, and for sustenance to supply him with stimulating panado.

7th. Continuing to be well, I consented to his liberation.

Case V.

On the 19th of October, I was requested to visit Mrs. C. aged about twenty-five years, who was maniacal in consequence of recent intemperance. Her perceptions were much diseased, as she asserted that she saw persons and things, which were not present. At times, while acting from the im-

pulse of her mental errors, I was told she had been very resolute and difficult to manage. For the last two or three days she had slept none; her pulse was ninety-six and weak. Within the last twenty-four hours she had been afflicted several times with some kind of fits, and I could not determine from the imperfect description which was given to me, whether they were epileptic or hysterical. Having formed an opinion unfavourable to the use of emetics when this disease is complicated with epileptic fits, I feared it would be improper to administer the antimony in this case. The stimulating method of treatment was selected, and laudanum was directed to be given every hour until sleep was induced.

20th. She had slept none, notwithstanding a large quantity of the laudanum had been given, and her insanity did not abate until the stomach became sick by the medicine, and some puking ensued. The family stated, that from the period of her having vomited, her mind had experienced an unequivocal improvement. This unlooked for event proved a lucky accident for the patient, as it encouraged me to have recourse to the emetic. Accordingly, I prescribed two grains of the tartrite of antimony to be given in a little warm water every fifteen minutes, until the stomach was freely evacuated.

21st. Was informed, that after eight grains of the tartrite had been given, free and copious puking was excited, a great quantity of bilious sordes were brought up, and in a short time afterwards she sunk into an easy and natural sleep, which continued for several hours. When she awoke, her mental affliction seemed to have nearly subsided, and at the time of my seeing her this day, I do not hesitate to say, that both in conversation and conduct (at least so far as I could ascertain) she was not only rational, but reflecting. The fits with which she had been affected, had not been reproduced by the action of the emetic, and I now think it probable that they were only hysterical, as during this visit she mentioned to me, that for the last two months, she had laboured under a suppression of the menses.

22d. She has perfectly recovered her intellectual faculties; and with the exception of menstruation, which has taken place

since yesterday, she is apparently free from all bodily indisposition.

24th. Has had no return of mania, and my attendance ended.

A further detail of cases it is presumed would be unnecessary, and of course would be a useless consumption of time and paper. I trust enough has been said to render it at least probable, that in this description of insanity, emetics promise to the practitioner very superior advantages. In relation however to the method of treatment, I think it is necessary to state, that, in this disease, the stomach has usually proved to be in a very torpid insensible condition, and in some instances this has been the case to such a degree, as to require a scruple, and even twenty-eight grains of the tartarized antimony to be administered before puking could be excited. I have also found, that when the stomach could not be excited to vomiting by the antimony, or by such doses of it as was deemed safe to give, this effect has been happily produced by changing the article for ipecacuanha, but not until very large doses of the latter had been administered. In the generality of cases, I believe the antimony has operated both on the stomach and bowels; but when this was not the case, and commonly when the ipecacuanha had been used, I have found it useful to empty the bowels with some purgative medicine. That usually preferred is a combination of jalap and soluble tartar, as was directed in the case of Mrs. M.

What will be the success of this practice in the numerous varieties of this disease, at present it is out of my power to say; further experience has in reserve the answer to this important inquiry. It must, however, not be forgotten by those who may hereafter think proper to give it a trial, that it has been mostly in simple cases, uncombined with other diseases, in which I have used it; and in such I *do* not hesitate to recommend it as vastly superior to any other method ever used. In one instance where it had supervened upon dysentery, and the patient in an exhausted condition, I found the emetic of no use. In another complicated with erysipelas, and severe syphilitic symptoms, it succeeded, in the cells of our infirmary, speedily and perfectly. The patient was a young woman

who was seized with insanity while under Dr. Dorsey's care in the surgical ward.

To conclude, I think it will be admitted, that the several advantages of the above mode of practice, the inconsiderable trouble it occasions the physician, and the facility with which relief is procured for the patient, constitute a subject which presents the most ample scope for observation and reflection. But at the present time I shall content myself with merely making a further statement of a single fact; and that is, within the last few months, more than thirty lunatics have been restored to their reason and to society by the employment of emetics under my direction. Twenty of which cures, I consider myself as fortunate in having it in my power to say, have been accomplished under the notice of the medical students, who attended the practice of our infirmary during last summer, and the remainder in my private practice.

February 10, 1817.

P. S. Such of the faculty in any part of the United States, who may think proper to give the above mode of practice a trial, will confer a particular favour by transmitting to me an account of their experience.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

THE NEW BLOW-PIPE.

Much interest appears to have been lately excited in England by Dr. Clarke's Experiments on the Blow-pipe, and the dangers of explosion attempted to be guarded against, by various contrivances. The following letter inserted in the Philosophical Magazine for December 1816, will show the importance attached to this interesting application of the gases in promoting fusion.

Sir,— The new blow-pipe, acting by a stream of condensed oxygen and hydrogen, has deservedly excited much interest: a detail of some experiments effected by means of this powerful instrument may prove interesting. I am following them up; and may merely mention, meantime, that the oxygen was obtained from *oxymuriate of potassa*, and the hydrogen from *zinc*, &c. The proportions, such as form the constituents of water:

1. Platinum as thick as a stocking wire was *instantly fused, scintillated*, and fell in a *large globule*.

2. Palladium *fused instantly* and *slightly scintillated.*

3. A watch-spring melted with most *splendid corruscations*, fused into a *large globule*, and even boiled *violently*.

4. Pure caustic alumina and magnesia burnt with *indescribable brilliancy*, exhibiting a *splendour of light rivalled only by the sun.*

5. Part of a tobacco-pipe *burnt vividly*, and was fused into glass.

6. A piece of indigo exhibited a *beautiful* and *intense flame.*

7. A fine *electric* tourmalin grew *red hot*, *instantly fused, and flamed.*—It did not *forego* its *electric powers.*

8. The diamond, in a groove of charcoal, was submitted to its influence:—In a short time it became *red hot*, then burst into flame; and, when dislodged from its nidus, it fell upon the table, and continued a *second or two in actual flame.*

Through Dr. Clarke the chemist has received an agent of the most extraordinary powers of ignition. Anticipation augurs in "breathless expectation" the most brilliant results. Man is only in the infancy of his being!

I am, respectfully, Sir,

Your most humble servant,

J. MURRAY.

Surrey Institution, Dec. 24, 1816.

P. S. A mass of PERCARBURET of iron (plumbago) gave beautiful *minute sparks*, and was *fused*.

ROCK CRYSTAL *decrepitated violently*. At this moment an explosion of the condensed gases took place, and the instrument was rendered useless.

This accident suspends for the present a continuation of the experiments; but the chemist must smile at danger when such brilliant results rise up in prospective. J. M.

Process for Sweetening Musty Corn.

Mr. Hatchett communicated to the Royal Society at their sitting, December 5, 1816, a process for sweetening musty corn, in a letter to Sir Joseph Banks. Several years ago this philosopher was engaged in researches into the quality and products of wheat and barley; in consequence of which he discovered that musty grain, which was so bitter as to be totally unfit for use, and which could scarcely be ground, might be rendered perfectly sweet and sound by simply immersing it in boiling water and letting it remain till the water became cold. The quantity of water in this case was always double that of the corn to be purified. Mr. H. found that the musty quality rarely penetrated through the husk of the wheat, and that in the very worst cases it did not extend through the amylaceous matter which lies immediately under the skin. In the hot water all the decayed or rotten grain swims on the surface, so that the remaining wheat is effectually cleaned from all impurities, and this too without any material loss. The wheat is afterwards to be dried, stirring it occasionally on the kiln, when it will be found improved to an extent which can scarcely be believed without actual experience. The immense quantities of musty corn now in merchants' ware-houses or granaries belonging to

farmers, render these experiments highly valuable at the present crisis; and it is not doubted that, whatever may be the cavils of ignorançe and inhumanity, the good sense of all those interested will lead them to adopt so easy, cheap, and effectual means of rendering their wheat or other grain from 10*s.* to 40*s.* a quarter more valuable. *Phil. Mag. for Dec.* 1816.

NEW FRIGORIFIC MIXTURE.

To Mr. Tilloch.

SIR,—Among the numerous mixtures which are attended with a diminution of sensible heat, a very convenient and effective one seems to have hitherto escaped the attention of chemists. It is that of snow and alcohol. The greatest effect appears to take place when equal weights of each are used, and I need scarcely add, that the precaution of effecting the solution in the least possible time is necessary to produce the maximum of cold.

The temperature both of the snow and alcohol being 32°, the solution in several experiments fell to — 17°, amounting to 49° of Fahrenheit. The alcohol was not of a very low specific gravity, so that I imagine it would not be difficult to produce at least an additional degree. The original communication not having reached you, and no memorandum having been preserved, I cannot now state what its strength was, nor does the season as yet admit of a repetition of the experiment; since the difference in the solubility of pounded ice and of snow will sensibly affect the results.

You will perceive that this circumstance explains the greater degree of cold generated by mixing snow with our strong wines, than by plunging the containing vessel into the ice and water.

I am, sir, your obedient servant,

J. MACCULLOCH.

Blackheath, Dec. 1816.

Ergot.

M. Virey in a communication to the French Academy of Sciences (formerly the Institute) states that the spur of the rye is not a *champignon* of the genus *Scleroticum*, as M. Decandolle had endeavoured to prove; but that it is a real disease of

the grain; since there are to be found in it all the peculiarities of organization of the rye, a degeneration as yet unknown in its nature, amylaceous fecula, and probably all the immediate materials of the Cerealia.—*Ibid.*

Oxalic Acid.

The number of subjects lately poisoned by the oxalic acid renders a more than ordinary degree of caution necessary on this subject. The principal use, we understand, to which this chemical preparation is applied, is to clean boot-tops; and, as it is not expensive, it is not only bought and sold with little reserve, but left about to be used when wanted. We have reason to believe that a large quantity is necessary to produce any dangerous effect, but the dose is far from being ascertained. It has usually been mistaken for Epsom salts, when any accident has happened. The account of the appearances after death are differently described; and, we suspect in this, as in other cases, sufficient distinction has not always been made between the destruction of the stomach and the neighbouring parts by the supposed poison and by the gastric juice. On this we are engaged in a few experiments, the result of which shall be recorded in our next. Meanwhile we shall be thankful for any well authenticated communications.

Lond. Med. and Phys. Jour.

A new French Pharmacopœia.

By an ordonnance of the King, bearing date the 8th August, 1816, the Codex Medicamentarius seu Pharmacopœia Gallica, ordered to be prepared by Napoleon in 1803, is forthwith to be printed; and, within the date of six months from its publication, every apothecary is bound to procure a copy, and always to prepare his medicines strictly according to the formula, under a penalty of 500 francs. Every copy is to be stamped, 1st, with the seal of the Faculty of Paris; 2d, with the signature of the president of the Faculty of Medicine at Paris; and 3d, with the bookseller's name. Every copy not so stamped and signed to be considered counterfeit, and the seller prosecuted by the King's attorney-general. It is a singular circumstance that there has been no French official Pharmacopœia published since the year 1748!—*Ibid.*

Notices respecting New Books.

The Second Part of the Philosophical Transactions of the Royal Society of London, for 1816, has just appeared, and the following are its contents:

11. An Essay towards the Calculus of Functions. Part ii. By C. Babbage, Esq. Communicated by W. H. Wollaston, M. D. Sec. R. S.—12. Experiments and Observations to prove that the beneficial Effects of many Medicines are produced through the Medium of the circulating Blood, more particularly that of the Colchicum autumnale upon the Gout. By Sir Everard Home, Bart. V. P. R. S. Communicated by the Society for improving animal Chemistry.—13. An Appendix to a Paper on the effects of the Colchicum autumnale on Gout. By Sir Everard Home, Bart. V. P. R. S.—14. On the cutting Diamond. By W. H. Wollaston, M. D. Sec. R. S.—15. An Account of the Discovery of a Mass of Native Iron in Brasil. By A. F. Mornay, Esq. in a Letter to W. H. Wollaston, M. D. Sec. R. S.—16. Observations and Experiments on the Mass of Native Iron found in Brasil. By W. H. Wollaston, M. D. Sec. R. S.—17. On Ice found in the Bottoms of Rivers. By T. A. Knight, Esq. F. R. S. In a Letter addressed to the Right Hon. Sir Jos. Banks, Bart. G. C. B. P. R. S.—18. On the Action of detached Leaves of Plants. By T. A. Knight, Esq. F. R. S. In a Letter addressed to the Right Hon. Sir Joseph Banks, Bart. G. C. B. P. R. S.—19. On the Manufacture of the Sulphate of Magnesia at Monte della Guardia near Genoa. By H. Holland, M. D. F. R. S.—20. On the Formation of Fat in the Intestine of the Tadpole, and on the Use of the Yelk in the Formation of the Embryo in the Egg. By Sir Everard Home, Bart. V. P. R. S.—21. On the Structure of the crystalline Lens in Fishes and Quadrupeds, as ascertained by its Action on polarized Light. By David Brewster, L L. D. F. R. S. Lond. and Edin. In a Letter to the Right Hon. Sir Joseph Banks, Bart. G. C. B. P. R. S.—22. Some further Account of the Fossil Remains of an Animal, of which a Description was given to the Society in 1814. By Sir Everard Home, Bart. V. P. R. S.—23. Further Observations on the Feet of Animals whose progressive Motion can

be carried on against Gravity. By Sir Everard Home, Bart. V. P. R. S.—24. A new Demonstration of the Binomial Theorem. By Thomas Knight, Esq. Communicated by W. H. Wollaston, M. D. Sec. R. S.—25. On the Fluents of irrational Functions. By Edward French Bromhead, Esq. M. A. Communicated by J. F. W. Herschel, F. R. S.

Dr. Spurzheim has been for a long time preparing for publication a work on Insanity with the following title, "Pathology of Animal Life, or the Manifestations of the Human Mind in the State of Disease termed Insanity." Every person who is acquainted with the very distressing conditions of persons afflicted with diseases of the mind, but particularly the insane poor, who are confined for the security of society in the melancholy cells of a madhouse, must be glad to hear that any new light is about to be thrown on this hitherto very obscure and incurable disorder. The public attention, too, has been particularly drawn towards this subject of late, by the very intimate scrutiny made into public lunatic asylums by persons invested with authority, before a committee of the house of commons:—an investigation rendered absolutely necessary by the shamefully neglected state of insane persons, and the general ignorance of the causes and cure of the disease itself;—an investigation, too, which has left the public mind in a state of alarm for the treatment of their unfortunate fellow-creatures. Dr. Spurzheim, who has devoted many years of his life, and has exercised the most powerful talents, in pursuing this disease through all its stages and varieties, and who has spared neither time nor expense in visiting the principal asylums for the insane in Europe, has at length determined to lay his labours before the public, with the hope that, since such a considerable progress in the knowledge of the physiology of the brain and the manifestations of the mind in a healthy state has of late been made, a great deal may yet be done for those who suffer from its partial or general derangement, by a philosophical comparison of a very numerous collection of cases, with the peculiar organization and moral habits of the individuals. The work will be published in the course of a few months.—*Tilloch's Philosophical Magazine.*

UNIVERSITY OF PENNSYLVANIA.

At a Commencement for conferring Degrees in Medicine and the Arts, held on the 10th of April, 1817, the Degree of Doctor of Medicine was conferred on the following gentlemen, their Theses being on the subjects specified below.

CANADA.

Basile Charlebois,	On the Regimen of Puerperal Women.
Thomas Boutillier,	Balsamum Canadense.

MASSACHUSETTS.

John Baxter, Jun.	Sweating as a Cure of Disease.
Winslow Warren,	Croup.

CONNECTICUT.

George Sumner,	Functions of the Kidney.

NEW JERSEY.

Ephraim Buck,	On Dyspepsia.

PENNSYLVANIA.

Thomas B. Evans,	On Splints.
W. H. Gillingham,	Hepatitis.
George Thum,	Growth.
Richard Randolph,	Suspended Animation.
Thomas Whitesides,	Uterine Hemorrhage.
John E. Espy,	On the Influence of the Digestive Organs, &c.
Azor L. Gregory,	Hepatitis.
A. A. Bertron,	Femoral Rupture.
Peter Cadwallader,	Collinsonia.
Jacob Sharpless,	Mania à Potu.
James M. Dougal,	Synocha Contagiosa.
Samuel Duffield,	Inguinal Hernia.
James A. Thackara,	Nicotiana.
William J. Clarke,	Trachitis.
Edward Haydock,	Phrenitis.

DELAWARE.

Charles Mendenhall,	Sympathies of the Stomach.
William Rumsey,	Respiration.
Jacob Moore,	Dropsy.

MARYLAND.

Henry Smith,	Cholera.
John K. Sappington,	Typhus Fever.
William Vanlear,	Dyspepsia.
William S. M'Pherson,	Dysentery.
William F. Harper,	Uterine Hemorrhage.
Samuel T. Kemp,	Pneumonia vera.

VIRGINIA.

Harden Massie,	Erysipelas.
James W. Paxton,	Pneumonia Typhoides.
Anderson Salle,	Hydrocephalus acutus.
Elias E. Buckner,	On the Principle of Life.
William Withers,	Cephalalgia.
Thomas Peete,	Cynanche Trachealis.
George Feild,	Cathartics.
Nathaniel Harrison,	Hepatitis acuta.
Edward H. Barton,	Epilepsy.
Robert Powel Page,	Diabetes.
Philip B. Thweatt,	Nicotiana.
Thomas P. Atkinson,	Hepatitis.
Robert R. Shore,	Bilious Colic.
Henry Clarkson,	Tetanus.
Thomas Martin,	Apocynum Cannabinum.
John Drish,	Arsenic.
John Bell,	Functions of the Liver.
Thomas T. Blackford,	Diabetes.
John Parke Street,	Compound Fractures.
Charles J. Payne,	Hydrocephalus acutus.
John Branch,	Remittent Fever.
Lewis W. Chamberlayne,	Intermittent Fever.
Samuel Wiles,	Typhus Pneumonia.
William D. Price,	Cortex Querci.
George W. Coleman,	Cynanche Trachealis.
Samuel W. Tompkins,	Fracture of Malleolus Internus.
Hubbard T. Minor,	Amenorrhœa.

NORTH CAROLINA.

Solomon B. Williams,	Apoplexy.
Wilie Perry,	Intermittents.

SOUTH CAROLINA.

William L. Kirkland,	Capsicum annuum.
Alexander Hume,	On Tumours.
John C. Tunno,	Popliteal Aneurism.
Benjamin Huger,	Dyspepsia.
Jacob D. Guerard,	Animal Poisons.
John W. M'Call,	Ligatures.
James H. B. Malcomson,	Oleum Terebinthinæ in Epilepsy.

GEORGIA.

William H. Cuyler,	Tetanus.
John Carter,	Cynanche Trachealis.
Charles D. Meigs,	Prolapsus Uteri.
William H. Pope,	Hydrophobia.

KENTUCKY.

George W. Smith,	Diseases, &c. of the Teeth.
Thomas P. Ross,	Diarrhœa.
Coleman Rogers.	

MISSISSIPPI TERRITORY.

William R. Coxe,	Hydrocephalus.

Abstract of the Bill of Mortality, for the Town of Boston, from the 31st of December, 1815, to the 1st of January, 1817; agreeably to the Record kept at the Health-Office.

Deaths in each Month.	*Males.*	*Females.*	*Totals.*	AGES.				
January, - -	44	47	91	Under	1	Year		186
February, - -	51	47	98	From	1	to	2	68
March, - -	45	38	83		2	to	5	59
April, - - -	39	48	87		5	to	10	29
May, - - -	42	30	72		10	to	20	49
June, - - -	29	24	53		20	to	30	142
July, - - -	33	28	61		30	to	40	114
August, - -	30	34	64		40	to	50	88
September, - -	33	41	74		50	to	60	57
October, - -	38	32	70		60	to	70	49
November, - -	23	37	60		70	to	80	48
December, - -	49	42	91		80	to	90	18
					90	to	100	2
Totals,	456	448	904				Total,	904

The above mentioned Deaths were caused by the following Diseases and Casualties, to wit:

Abscess,	1	Fever Rheumatic,	3	Neurosis,	1
Apoplexy,	18	Pleurisy,	1	Old Age,	37
Burns,	3	Puerperal,	12	Palsy,	8
Cancers,	2	Pulmonic,	61	Phrenitis,	1
Casualty,	5	Typhus,	15	Polypus in the nose,	1
Cholera,	5	Fits,	16	Quinsy,	16
Consumption,	180	Hæmoptysis,	1	Scalds,	2
Cramp,	2	Hæmorrhagia,	1	Scarlatina anginosa,	1
Croup,	4	Hepatitis,	2	Scirrhous Liver,	1
Cynanche Trachealis,	2	Hooping Cough,	9	Still-Born,	31
Dyspepsy,	18	Hydrocephalus,	12	Sudden,	21
Diseases unknown,	84	Jaundice,	3	Suicide,	4
Drowned,	12	Infantile Diseases,	195	Tetanus,	1
Dropsy,	12	Intoxication,	3	White Swelling,	1
Dysentery,	6	Insanity,	2	Worms,	1
Elephantiasis,	1	Marasmus,	37		
Fever Inflammatory,	7	Measles,	6		
Bilious,	10	Mortification,	13	Total,	904
*Malignant,	11	Murdered,	2		

Published by order of the Board of Health,

NATHANIEL GREENOUGH, Secretary.

Boston, February 5, 1817.

☞ BOSTON lies in 42, 23, 15, N. lat. and 70, 52, 42, W. long.—The Census of 1810, in the month of August, states the number of inhabitants at 32,250.

⁂ The reader will see by the preceding official Bill of Mortality, that by the kindness of a good Providence, and the exertion made to diffuse the blessing of Vaccination through the town, not a single instance of mortality by *Small Pox* occurred in Boston during the last year. [*Boston Centinel.*

* *Ten of these cases occurred in the Hospital on Rainsford Island.*

ANNUAL REPORT OF INTERMENTS

In the city and county of New-York; commencing on the first day of January, and ending on the thirty-first day of December, 1816; *shewing the ages, sexes, and diseases of the persons who died. Published by order of the Common Council.*

1816.	*January.*	*February.*	*March.*	*April.*	*May.*	*June.*	*July.*	*August.*	*September.*	*October.*	*November.*	*December.*	*Total.*
Men, - - -	119	93	74	94	89	58	60	57	81	63	54	60	902
Women, - - -	81	66	63	55	67	44	53	64	50	63	60	54	720
Boys, - - -	73	39	44	39	37	32	54	66	62	57	50	50	603
Girls, - - -	73	45	42	46	32	23	46	53	41	26	39	48	514
Total.	346	243	223	234	225	157	213	240	234	209	203	212	2739

CONTINUED.

AGES. OF WHOM WERE OF	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
The age of 1 year and under	61	33	36	37	33	25	59	61	48	43	36	50	522
Between 1 and 2	12	9	14	12	11	7	15	25	20	17	15	21	178
2 — 5	39	19	16	15	10	11	17	19	26	14	18	14	218
5 — 10	22	15	13	12	9	4	5	4	5	5	8	5	107
10 — 20	17	11	7	7	12	10	20	10	8	8	16	10	136
20 — 30	62	33	34	31	33	26	23	31	34	28	24	27	386
30 — 40	46	30	36	31	34	24	23	41	38	35	31	27	405
40 — 50	37	33	31	39	28	20	17	23	21	30	25	21	325
50 — 60	23	17	8	20	18	10	12	11	12	18	13	14	176
60 — 70	13	20	13	13	21	13	15	6	7	4	9	13	147
70 — 80	7	7	11	14	13	4	4	7	6	6	5	6	90
80 — 90	5	7	3	3	3	3	3	2	6	1	2	4	42
90 — 100	2	0	1	0	0	0	0	0	3	0	1	0	7
TOTAL.	346	243	223	234	225	157	213	240	234	209	203	212	2739

CONTINUED.

1816.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
DISEASES AND CASUALTIES.													
Abscess,	1	1	2	1	1	0	1	0	0	2	0	1	10
Aneurism,	1	1	0	0	1	0	0	0	0	0	0	0	3
Apoplexy,	5	4	5	5	2	8	4	2	3	5	3	7	53
Asphyxia,	0	0	0	1	0	0	0	0	1	0	0	0	2
Asthma,	1	0	1	2	1	1	0	0	0	0	1	3	10
Burned or Scalded,	1	0	1	2	1	0	1	0	1	0	1	5	13
Carbuncle,	0	0	0	0	0	1	0	0	1	0	0	0	2
Cancer,	0	1	0	1	0	1	0	1	3	1	1	2	11
Casualty,	2	2	2	4	2	1	1	1	2	2	1	0	20
Catarrh,	8	7	4	1	0	1	0	0	1	2	1	1	26
Child-bed,	0	1	2	2	3	1	1	2	2	4	2	2	22
Cholera Morbus,	1	0	0	1	2	2	1	10	6	1	0	0	24
Colic,	3	0	0	0	0	0	2	1	1	0	2	0	9
Compression of the Brain,	0	0	0	1	2	1	0	0	0	0	0	1	5
Consumption,	67	65	60	52	59	34	53	69	56	47	61	55	678
Convulsions,	24	9	13	17	15	8	16	15	7	6	13	14	157
CARRIED OVER.	114	91	90	90	89	59	80	101	84	70	86	91	1045

CONTINUED.

1816.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
BROUGHT OVER.	114	91	90	90	89	59	80	101	84	70	86	91	1045
Cramp in the stomach,	1	0	4	2	3	0	2	0	0	0	0	0	12
Diarrhœa,	0	2	1	0	0	0	2	5	9	1	1	0	21
Drinking cold water,	0	0	0	0	0	1	0	0	0	0	0	0	1
Dropsy,	8	14	4	9	8	7	7	6	7	8	5	7	90
Dropsy in the chest,	1	2	2	3	4	1	2	2	1	0	0	2	20
Dropsy in the head,	9	8	8	6	10	9	6	9	10	6	11	9	101
Drowned,	3	1	4	8	4	7	6	5	7	4	2	1	52
Dysentery,	4	2	0	0	2	0	10	10	22	13	6	2	71
Dyspepsia,	0	0	0	0	1	1	0	0	0	0	0	0	2
Epilepsy,	0	0	0	1	1	0	1	1	0	0	0	1	5
Erysipelas,	0	1	0	1	1	0	0	0	1	0	0	0	4
Executed,	1	0	0	0	0	0	0	0	0	0	0	0	1
Fever,	2	2	1	3	0	0	0	2	1	1	0	0	12
Fever, bilious,	0	0	0	0	1	0	0	1	1	1	0	0	4
Fever, hectic,	0	0	1	0	2	0	0	1	0	1	1	0	6
Fever, inflammatory,	0	0	0	0	0	1	0	0	1	0	0	0	2
CARRIED OVER.	143	123	115	123	126	86	116	143	144	105	112	113	1449

CONTINUED.

1816.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
BROUGHT OVER.	143	123	115	123	126	86	116	143	144	105	112	113	1449
Fever, intermittent,	1	1	0	1	1	0	1	0	0	0	0	0	5
Fever, puerperal,	1	1	0	1	0	0	0	0	0	0	0	3	6
Fever, remittent,	0	0	2	0	2	0	2	0	0	2	2	0	10
Fever, typhus,	4	2	6	6	9	8	7	9	15	12	15	7	100
Flux, infantile,	0	0	0	0	0	0	0	0	0	0	0	1	1
Fracture,	0	0	0	0	0	0	2	1	1	1	0	0	5
Frozen,	0	0	0	0	0	0	0	0	0	0	0	1	1
Gout,	0	1	1	1	0	0	0	0	0	0	0	1	4
Gravel,	1	0	0	1	1	0	0	1	0	0	0	0	4
Hæmorrhage,	0	0	0	0	1	0	0	1	0	2	1	1	6
Hæmoptysis,	0	1	1	0	2	0	0	0	0	0	2	2	8
Herpes,	0	0	0	0	0	0	0	0	0	1	0	0	1
Hives or Croup,	12	11	8	8	6	2	9	3	4	7	5	7	82
Jaundice,	0	1	1	0	1	2	1	1	0	1	1	2	11
Iliac Passion,	0	0	0	0	0	1	0	0	0	0	0	0	1
Infanticide,	0	1	0	0	0	0	0	0	2	0	0	0	3
CARRIED OVER.	162	142	134	141	149	99	138	159	166	131	138	138	1697

CONTINUED.

1816.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
BROUGHT OVER.	162	142	134	141	149	99	138	159	166	131	138	138	1697
Inflammation of the Bladder, . .	0	0	0	1	0	0	0	0	0	0	0	0	1
Inflammation of the Bowels, . .	3	3	2	7	9	6	2	7	3	3	0	5	50
Inflammation of the Brain, . .	4	1	1	2	1	1	1	1	1	2	0	1	16
Inflammation of the Chest, . .	1	3	2	7	6	6	4	1	2	7	3	7	49
Inflammation of the Liver, . .	1	0	2	1	0	1	2	2	0	5	1	2	17
Inflammation of the Stomach, . .	0	0	0	0	0	1	0	0	0	1	1	0	3
Influenza, ...	1	0	0	0	0	0	0	0	0	0	0	0	1
Insanity, ...	2	0	1	0	0	2	1	0	3	0	0	3	12
Intemperance, ...	5	3	0	2	2	4	1	1	0	3	7	2	30
Killed or Murdered, . . .	1	0	0	1	1	0	0	0	0	0	1	0	4
Locked Jaws, ...	1	1	0	0	0	2	1	0	1	1	1	0	8
Lumbar Abscess, ...	1	0	1	0	0	0	0	1	0	0	0	1	4
Marasmus, ...	0	1	2	1	0	1	0	0	0	0	0	0	5
Measles, ...	1	0	0	0	0	1	0	3	1	1	4	6	19
Mortification, ...	0	0	0	0	1	1	1	3	3	3	2	4	17
Nervous Disease, ...	1	0	0	0	2	0	1	1	0	0	1	0	6
CARRIED OVER.	184	154	145	163	171	125	152	179	180	158	159	169	1939

CONTINUED.

1816.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
BROUGHT OVER.	184	154	145	163	171	125	152	179	180	158	159	169	1939
Old Age,	11	9	9	8	8	2	3	3	8	2	6	4	73
Palsy,	3	1	5	1	2	3	1	0	1	3	1	1	22
Peripneumony,	4	0	4	3	1	0	4	1	1	0	0	0	18
Pleurisy,	13	9	11	13	13	2	7	2	6	5	1	3	85
Pneumonia Typhodes,	1	5	2	9	11	3	2	0	1	0	2	0	36
Quinsy,	1	0	0	0	0	0	0	0	0	1	3	0	5
Rheumatism,	1	1	1	0	0	0	1	0	2	1	0	1	8
Rickets,	1	0	0	0	0	0	0	0	0	0	0	0	1
Rupture,	0	0	1	0	1	0	0	0	0	0	0	0	2
Schirrus of the Liver,	0	0	0	0	0	0	2	0	0	0	0	0	2
Scrofula, or the king's evil,	0	1	1	1	1	2	1	0	0	0	0	2	9
Small Pox,	98	40	20	10	5	2	2	1	1	0	0	0	179
Sore Throat,	1	0	0	0	0	0	1	2	0	0	0	0	4
Sprue,	1	1	1	2	0	2	4	4	2	3	0	3	23
Still-born,	8	5	5	6	6	4	14	10	5	7	6	12	88
Strangury,	0	0	1	0	0	0	1	1	0	0	0	0	3
CARRIED OVER.	327	226	206	216	219	145	195	203	207	180	178	195	2497

CONTINUED.

1816.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
BROUGHT OVER.	327	226	206	216	219	145	195	203	207	180	178	195	2497
Sudden Death,	2	1	1	2	0	1	4	1	0	1	1	2	18
Suicide,	0	1	0	5	0	0	1	4	0	2	2	0	15
Syphilis,	0	2	3	2	0	1	0	1	2	0	0	0	11
Tabes Mesenterica,	1	1	2	1	0	0	3	5	8	13	10	3	47
Teething,	0	0	2	4	1	1	2	7	6	4	2	2	31
Vomica,	0	0	0	0	0	1	0	0	0	0	0	0	1
Ulcer,	0	1	0	0	0	0	0	1	1	0	0	0	3
Unknown,	0	2	1	2	2	5	6	13	4	6	0	6	47
Whooping Cough,	13	4	7	0	2	2	1	3	3	2	4	3	44
Worms,	2	5	1	1	1	1	1	2	3	1	6	1	25
TOTAL.	346	243	223	234	225	157	213	240	234	209	203	212	2739

REMARKS.

The City Inspector respectfully reports to the Board, a statement of the deaths, in the city and county of New-York, for the Year 1816.

The number of deaths were two thousand seven hundred and thirty-nine, being an excess of two hundred and thirty-two, over what took place in the preceding year. This increase in the deaths may be accounted for,—from the increased population in the city,—from the ravages of that pestilent epidemic the *Small Pox*, which carried off in 1816, eighty-five persons more than those which became its victims in 1815; and also, from returns of deaths being made at his office, by some sextons in distant parts of the island during the last year, who had neglected to perform this necessary part of their duty before that period. From these united considerations the City Inspector is of opinion, that the city has been generally as healthy as heretofore, with the exception of the first months of the past year, which were unusually mortal; in January especially, ninety-eight persons died of the '*Small Pox*' alone, among whom was an aged woman of 97 years, a melancholy proof of the weakness of human nature, particularly in a city, where an institution exists, capable, by vaccination, of averting the horrors of that loathsome and deadly disease, and thereby preserving so many valuable lives.

The City Inspector observes that the number of '*Consumptive*' cases were six hundred and seventy-eight, exceeding by sixty, that which took place in 1815; he is of opinion that many cases were returned '*Consumptive*' which should have been reported under other heads; in children, particularly, worms are known to be fatal, they pine under their influence, and are, from their changing symptoms, frequently misunderstood and therefore returned inaccurately. In adults also, many cases reported in like manner as '*Consumptive*,' in reality spring from *irregularities*, which the feelings of relations and friends induce to class in this general and sweeping complaint; thus covering their infirmities from the public observation,

under the operation of very natural, and perhaps not unpraiseworthy motives.* GEORGE CUMING,
CITY INSPECTOR.

New-York, January 13, 1817.

By a report of Deaths in the Borough of Harrisburgh, Pennsylvania, from January 1, 1816, *to Jan.* 1, 1817, *furnished by Dr. Joseph Kelso, it appears that the whole number was fifty-six. The diseases noticed are:—*

Abscess of the Lungs,	1
Bilious Fever,	6
Child Bed,	3
Consumption,	6
Colic,	1
Cholera Infantum,	8
Dropsy,	2
Fits,	7
Hives,	2
Inflammatory Fever,	1
Jaundice,	4
Marasmus,	1
Old Age,	3
Palsy,	2
Pleurisy,	1
Small Pox,	1
Typhoid state of fever,	2
Besides—Drunkenness,	4
Still Born,	4
Sudden,	1
Unknown,	1
	56

The Population of Harrisburgh is estimated at three thousand two hundred persons.

* Until the above judicious remarks are more carefully attended to, we cannot expect an accurate list of the cases of pulmonary consumption.
-*Editors.*

Statement of Deaths, with the diseases and ages, in the City and Liberties of Philadelphia, from the 1st of January 1816, to the 1st of January 1817.

DISEASES.	Under 1 year	From 1 to 2	From 2 to 5	From 5 to 10	From 10 to 20	From 20 to 30	From 30 to 40	From 40 to 50	From 50 to 60	From 60 to 70	From 70 to 80	From 80 to 90	From 90 to 100	From 100 to 110	Total
Aphthæ - - - -	6	0	0	1	0	0	0	0	0	0	0	0	0	0	7
Asthma - - - -	1	0	1	0	2	2	1	3	3	0	1	2	0	0	16
Abscess - - - -	1	1	0	1	0	0	0	3	1	1	1	0	0	0	9
Aneurism - - - -	0	0	0	0	0	0	3	1	0	0	0	0	0	0	4
Apoplexy - - - -	0	0	0	0	0	2	7	6	4	11	5	1	0	0	36
Atrophy - - - -	7	3	2	0	2	0	0	5	1	2	5	2	0	0	29
Angina Pectoris -	0	0	0	0	1	0	1	1	1	0	0	0	0	0	4
Burns - - - -	1	2	4	2	0	2	2	1	0	2	1	0	0	1	18
Cancer - - - -	0	0	0	0	0	1	2	3	5	1	0	2	0	0	14
Casualties - - - -	0	0	0	0	0	5	3	7	0	0	1	1	0	0	17
Catarrh - - - -	17	10	10	2	1	1	2	0	1	1	1	0	0	0	46
Child Bed - - -	0	0	0	0	*1	4	3	1	0	0	0	0	0	0	9
Cholera Morbus -	27	38	20	2	0	1	0	0	0	2	0	0	0	0	90
Colic - - - - -	1	0	0	0	0	0	2	1	0	0	1	0	0	0	5
Consumption of the Lungs	9	13	9	10	17	91	113	104	31	27	9	1	0	0	434
Convulsions - - -	111	0	8	2	4	3	4	6	5	0	0	2	0	0	167
Curved Spine - - -	0	22	1	0	0	0	0	0	0	0	0	0	0	0	1
Caries - - - - -	0	0	0	0	1	1	0	0	1	0	0	0	0	0	3
Cachexy - - - -	1	0	1	1	0	0	0	1	0	2	0	0	0	0	6
Compression of Brain	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Decay - - - - -	9	2	2	1	1	6	0	3	4	4	4	2	1	0	39
Diarrhœa - - - -	1	1	4	0	0	1	10	3	10	2	1	0	0	0	33
Dropsy - - - -	2	0	1	2	2	2	6	7	11	10	5	8	1	0	52
of the Breast - -	0	0	0	2	0	2	3	6	4	2	1	1	0	0	21
in the Brain - -	10	18	18	32	2	0	1	1	0	0	0	0	0	1	83
Drowned - -	0	0	1	2	2	5	19	2	1	2	0	0	0	0	34
Dysentery - - -	6	4	5	4	1	1	3	1	4	1	0	0	0	0	30
Drunkenness - -	0	0	0	0	0	1	4	2	1	0	0	0	0	0	8
Disease in Hip Joint	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Debility - - - -	17	3	1	13	2	1	5	6	2	2	5	1	0	0	58
Dislocation - - -	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Epilepsy - - - -	0	0	1	0	0	1	2	0	1	0	0	0	0	0	5
Erysipelas - - -	6	0	1	0	1	1	5	1	1	3	0	0	0	0	19
Fracture - - - -	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4
Fever - - - - -	1	2	3	1	3	6	6	10	2	2	1	0	1	0	38
Intermittent - -	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
Remittent - - -	0	0	0	5	1	2	4	3	1	1	3	1	1	0	22
Bilious - - -	1	0	0	1	4	2	4	2	1	1	1	0	0	0	17
Nervous - - -	0	0	1	1	2	0	0	0	1	0	1	0	0	0	6
Malignant - -	0	0	1	0	0	0	0	0	1	0	0	0	0	0	2
Typhus - - -	0	0	1	1	2	18	24	11	8	9	3	0	1	0	78
Puerperal - -	0	0	0	0	1	13	8	2	0	0	0	0	0	0	24
Hectic - - -	0	0	0	0	0	0	1	1	2	0	0	0	0	0	4
Inflammatory -	0	0	2	0	0	1	0	0	1	0	0	0	0	0	4
Carried over,	229	119	98	87	54	178	248	205	112	89	50	19	5	2	1501

* Eighteen years of age.

	Under 1 year	From 1 to 2	From 2 to 5	From 5 to 10	From 10 to 20	From 20 to 30	From 30 to 40	From 40 to 50	From 50 to 60	From 60 to 70	From 70 to 80	From 80 to 90	From 90 to 100	From 100 to 110	Total
Brought forward,	229	119	98	87	54	178	248	205	112	89	50	19	5	2	1501
Gangrene and Mortification	1	2	1	4	1	3	4	3	1	2	0	1	0	0	23
Gout - - - - - -	0	0	0	0	0	1	1	0	1	3	0	1	0	0	7
Gravel - - - - - -	0	0	0	0	0	0	1	2	0	0	1	0	0	0	4
Hooping Cough - -	15	10	18	2	1	0	0	0	0	0	0	0	0	0	46
Hives - - - - - -	13	4	11	2	0	0	0	0	0	0	0	0	0	0	30
Hernia - - - - - -	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2
Hæmorrhage - - -	0	0	0	0	0	4	3	0	1	1	0	1	0	0	10
Hydrophobia - - -	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Inflammation of the Brain	1	0	1	5	2	5	3	2	2	0	2	0	0	0	26
of the Lungs - -	7	1	2	0	2	1	1	2	1	2	0	0	0	0	19
of the Stomach -	0	1	2	0	0	0	3	0	1	0	1	0	0	0	8
of the Bowels - -	9	1	2	1	2	3	1	5	1	2	0	0	0	0	27
of the Liver - -	2	1	0	1	0	2	4	6	1	1	0	0	0	0	18
of the Bladder -	0	0	0	0	1	0	0	1	1	0	0	1	0	0	4
Insanity - - - - -	0	0	0	0	0	4	15	5	3	0	0	0	0	0	27
Jaundice - - - - -	0	0	0	0	0	1	0	1	0	1	0	0	0	0	3
Lethargy - - - - -	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Measles - - - - -	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
Murdered - - - -	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Old Age - - - - -	0	0	0	0	0	0	0	0	0	0	8	34	10	3	65
Pleurisy - - - - -	17	7	8	4	2	17	34	12	17	8	2	2	0	0	130
Palsy - - - - - -	1	0	1	0	1	1	2	0	5	5	3	3	0	0	22
Pistol Shot Wound	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Rickets - - - - - -	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Rheumatism - - -	0	0	0	0	0	1	3	1	0	1	0	0	0	0	6
Scrofula - - - - -	0	1	1	2	3	1	1	0	2	0	0	0	0	0	11
Sore Throat - - -	4	1	4	1	0	3	2	0	2	2	0	0	0	0	19
Still Born - - - - -	94	0	0	0	0	0	0	0	0	0	0	0	0	0	94
Suicide - - - - -	0	0	0	0	1	1	4	2	0	0	0	0	0	0	8
Sudden - - - - -	4	0	0	1	0	5	11	6	1	6	0	0	0	0	34
Syphilis - - - - -	0	0	0	0	0	5	3	0	0	0	0	0	0	0	8
Strangury - - - -	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Small Pox natural -	15	5	13	16	9	25	8	4	1	1	0	0	0	0	97
Spina Bifida - - -	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Teething - - - - -	8	10	5	0	0	0	0	0	0	0	0	0	0	0	23
Tabes - - - - - -	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Ulcers - - - - - -	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
Worms - - - - -	0	4	4	4	0	0	0	0	0	0	0	0	0	0	12
Unknown - - - - -	6	0	0	0	0	9	12	8	1	0	0	0	0	0	36
Total,	482	168	171	133	81	272	366	265	154	126	68	63	15	5	2319

NOTE. Of the above there were 703 males of twenty years and upwards, 450 under twenty years: of females, 585 of twenty years and upwards, 399 under twenty years; and 182 children, principally under one year, whose sex is unknown.

Deaths in each month of the above period.

	Adults.	Children.	*Total.*
January - -	99	82	181
February - -	118	83	201
March - - -	105	88	193
April - - -	109	69	178
May - - -	108	75	183
June - - -	135	91	226
July - - -	131	97	228
August - -	113	123	236
September -	100	106	206
October - -	97	95	192
November - -	82	60	142
December - -	98	55	153
Total - - -	1295	1024	2319

By order of the Board of Health,

JOHN ALLISON, Clerk.

Health Office, February 7th, 1817.

Abstract of the Bills of Mortality, for the City and Precincts of Baltimore, from the first day of January, 1816, *to the first of January,* 1817; *taken from the Record in the Office of the Commissioners of Health.*

Deaths in each Month.	*Males.*	*Females.*	*Totals.*	AGES.				
				Under	1	Year		477
				From	1	to	2	73
					2	to	3	64
January, - -	59	50	109		3	to	5	40
February, - -	59	51	110		5	to	10	54
March, - -	57	55	112		10	to	20	166
April, - -	57	38	95		20	to	30	176
May, - -	54	30	84		30	to	40	102
June, - -	56	31	87		40	to	50	53
July, - -	59	43	102		50	to	60	41
August, - -	107	105	212		60	to	70	26
September, - -	73	65	138		70	to	80	37
October, - -	36	44	80		80	to	90	5
November, - -	58	52	110		90	to	100	2
December, - -	43	35	78		100	to	110	1
Totals,	718	599	1317			Total,		1317

The above mentioned Deaths were caused by the following Diseases and Casualties, to wit:

Apoplexy, - - - -	5	Inflammation of the Liver, -	5
Asthma, - - - -	2	Insanity, - - - - -	3
Cancer, - - - -	4	King's Evil, - - - - -	2
Casualties, - - - -	27	Lock Jaw, - - - - -	2
Cold, - - - - -	11	Measles, - - - - -	7
Child Bed, - - - -	26	Mortification, - - -	17
Cholera Morbus, - -	132	Mumps, - - - - -	1
Colic (Bilious) - - -	5	Murder, - - - - -	2
(Cramp) - - -	11	Old Age, - - - - -	54
Consumption, - - -	250	Palsy, - - - - -	10
Croup, - - - -	39	Pleurisy, - - - - -	75
Dropsy, - - - -	33	Quinsy, - - - - -	3
in the Brain, - -	3	Rheumatism, - - - -	3
Drowned, - - - -	20	Sore Throat, - - - -	1
Dysentery, - - - -	12	St. Anthony's Fire, - -	10
Fever (Bilious) - - -	50	Small Pox, - - - - -	2
(Nervous) - - -	5	Stillborn, - - - - -	78
(Typhus) - - -	28	Sudden Death, - - -	9
Fits, - - - - -	91	Suicide, - - - - -	1
Flux, - - - - -	5	Teething, - - - - -	3
Gout, - - - - -	3	Unknown, - - - - -	54
Gravel, - - - -	2	Venereal, - - - - -	1
Hemorrhage, - - -	6	Worms, - - - - -	76
Hooping Cough, - - -	105	White Swelling, - - -	2
Jaundice, - - - -	7		
Inflammation, - - -	3	Total, - -	1317
(of the brain) - -	2		

By order of the Board of Health,

SAMUEL YOUNG, Secretary.

☞ The City and Precincts of *Baltimore,* are now supposed to contain upwards of 60,000 inhabitants.

Statement of Deaths, with the Diseases and Ages, in the city and vicinity of Charleston, (S. C.) from the first of October, 1815, to the first of October, 1816.

Deaths in each Month.	*Adults.*	*Children.*	*Totals.*
October,	54	24	78
November,	34	22	56
December,	22	36	58
January,	61	29	90
February,	47	25	72
March,	55	28	83
April,	50	22	72
May,	66	28	94
June,	48	32	80
July,	41	24	65
August,	42	24	66
September,	47	15	62
Totals,	567	309	876

AGES.			
Under 3	Years		145
From 3	to	10	83
10	to	20	95
20	to	30	162
30	to	40	126
40	to	50	87
50	to	60	62
60	to	70	49
70	to	80	32
80	to	90	29
90	to	100	2
100	to	110	4
		Total,	876

Of the above, there were 483 Males,
393 Females.

Total, 876

Of these, there were of
Whites, 332
Blacks and colored, 544

Total, 876

The above mentioned Deaths were caused by the following Diseases and Casualties, viz:

Abscess,	2	Fever, Catarrhal,	9	Rickets,	1
Accident,	13	Nervous,	11	Rheumatism,	2
Aneurism,	1	Typhus,	21	Rupture of Blood Vessel,	1
Apoplexy,	16	Worm,	38	Scrophula,	1
Asthma,	4	and Ague,	2	Scurvy,	2
Atrophy,	1	Hæmorrhage,	1	Small-Pox,	15
Bowel Complaint,	46	Hydrocephalus,	1	Sore Throat,	7
Cancer,	13	Influenza,	34	Sore Throat, putrid,	2
Childbed,	15	Inflammation of the Lungs,	1	Spasm,	10
Colic,	1	Eruption,	1	Still Born,	9
Cholera Morbus,	1	Insanity,	9	Stricture,	1
Cold,	18	Intemperance,	4	Stroke of the Sun,	1
Consumption of the Lungs,	149	King's Evil,	1	Suicide,	2
Convulsions,	43	Liver Complaint,	3	Teething,	29
Croup,	10	Lock-Jaw,	5	Thrush,	1
Debility,	83	Mortification,	5	Violence,	4
Diarrhœa,	1	Old Age,	51	Unknown,	4
Dropsy,	49	Palsy,	5	Hooping Cough,	4
Dropsy in the Head,	5	Paralytic,	1		
Drowned,	7	Phthisic,	2		
Dysentery,	21	Pleurisy,	22		
Fever,	27	Pneumonia,	1	Total,	876
Bilious,	38	Quinsy,	1		

☞ The Population of the City of *Charleston* and its Vicinity, is computed at about from 32 to 35,000 souls.

LIST OF RECENT MEDICAL PUBLICATIONS.

Institutions of Physiology, by Professor Blumenbach; a new edition with extensive notes, by John Elliotson, M.D.

An Inquiry into the Effects of Spirituous Liquors on the Physical and Moral Faculties of Man, and on the Happiness of Society.

A Practical Synopsis of Cutaneous Diseases, according to the arrangement of Dr. Willan, &c. &c. By Thomas Bateman, M.D. F.R.S. &c. Fourth edition, octavo. Plates.

Observations on the Structure of the Brain; comprising an estimate of the claims of Drs. Gall and Spurzheim to discovery in the Anatomy of that Organ. By John Gordon, M.D. F.R.S. Ed. &c. &c.

An Experimental Enquiry into the Effects of Tonics and other Medicinal Substances on the cohesion of the Animal Fibre. By the late Adair Crawford, M.D. F.R.S. Edited by Alexander Crawford, M.D. London, 1816.

Medico-Chirurgical Transactions, published by the Medical and Chirurgical Society of London, Vol. VII. 1816.

A treatise on Uterine Hæmorrhage, by Duncan Stewart, M.D. London, 1816.

Minutes of Cases of Cancer and Cancerous Tendency, successfully treated, by Samuel Young, Surgeon; with a prefatory letter, by S. Whitbread, Esq. M.P. Second edition. London, 1816.

Outlines of Geology, by W. T. Brande, F.R.S. Professor of Chemistry, Royal Institute.

Transactions of the Medical Society of London, Vol. I. Part I.

Practical Observations on the Diseases of the Urinary Organs, by John Howship, member of the Royal College of Surgeons. 8vo. with four coloured plates.

Surgical Observations, part II. by C. Bell. 8vo.

Medical Suggestions for the Treatment of Dysentery, Intermittent and Remittent Fevers, as generally prevalent at certain seasons among Troops in the Field. By E. S. Somers, M.D. 8vo.

An Essay on the common cause and prevention of Hepatitis, by Charles Griffith, M.D. 8vo.

Essay on the Origin, Progress and present State of Galvanism, by M. Donovan.

Rudiments of the Anatomy and Pathology of the Human Body, by T. J. Armiger. London, 1816.

A Treatise on the Nature and Cure of Gout, &c. by Charles Scudamore, M.D. London, 1816.

Memoire sur la Complication des Plaies et des Ulcères connues sous le nom de pourriture d'hôpital, par J. Delpech; suivie d'un rapport, &c. Paris.

Essai sur l'Hygiene Militaire des Antilles, par Alex. Moreau de Jonnés. Paris, 1816.

Precis Historique sur l'irruption de la Fievre Jaune à la Martinique, en 1802. (by the same.) Paris, 1816.

J. Hartshorne's

THE

ECLECTIC REPERTORY

AND

ANALYTICAL REVIEW.

Vol. VII. JULY, 1817. No. III.

SELECTED PAPERS.

Professor Silliman on the Blow-Pipe.

[From the New York Daily Advertiser.]

Yale College, April 7, 1817.

MR. DWIGHT,

AS a friend to the reputation of our country, in science, as well as to its other important interests, I presume you will be willing to publish the following statement of facts.

Various notices, more or less complete, chiefly copied from English newspapers, are now going the round of the public prints, in this country, stating that "a *new kind of fire*" has been discovered, in England; or, at least, new, and heretofore, unparalleled means of exciting heat, by which, the gems and all the most refractory substances in nature, are immediately melted; and even in various instances, dissipated in vapour, or decomposed into their elements. The first glance at these statements, (which, as regards the effects, I have no doubt, are substantially true,) was sufficient to satisfy me, that the basis of these achievements was laid by an American discovery, made by Mr. Robert Hare, of Philadelphia, in 1801. In December of that year, Mr. Hare communicated to the Chemical Society of Philadelphia, his discovery of a method of burning oxygen and hydrogen gases, in a united stream, so as

to produce a very intense heat. In 1802, he published a detailed memoir on the subject, with an engraving of his apparatus, and he recited the effects of his instrument, some of which, in the degree of heat produced, surpassed any thing before known.—In 1802 and 1803, I was occupied with him in Philadelphia, in prosecuting similar experiments on a more extended scale, and a communication on the subject was made to the Philosophical Society of Philadelphia; the memoir is printed in their transactions; and Mr. Hare's original memoir was re-printed in the Annals of Chemistry, in Paris, and in the Philosophical Magazine, in London. Mr. Murray, in his system of Chemistry, has mentioned Mr. Hare's results in the fusion of several of the earths, &c. and has given him credit for his discovery.

In one instance, while in Europe—in 1806, at a public lecture, I saw some of them exhibited by a celebrated professor, who mentioned Mr. Hare as the reputed author of the invention.

In December 1811, I instituted an extended course of experiments with Mr. Hare's blow-pipe, in which I melted lime and magnesia and a long list of the most refractory minerals, gems and others, the greater part of which had never been melted before, and I supposed that I had decomposed lime, barytes, strontites and magnesia, evolving their metallic bases, which burnt in the air, as fast as produced. I communicated a detailed account of my experiments to the Connecticut Academy of Arts and Sciences, who published it in their transactions for 1812; with their leave, it was communicated to Dr. Bruce's Mineralogical Journal, and it was printed in the 4th No. of that work. Hundreds of my pupils can testify, that Mr. Hare's splendid experiments, and many others performed with his blow-pipe fed by oxygen and hydrogen gases, have been for years past annually exhibited, in my public courses of chemistry, in Yale College; and that the fusion and volatilization of platina, and the combustion of that metal, and of gold and silver, and of many other metals; that the fusion of the earths, of rock crystal, of gun flint, of the corundum gems, and many other very refractory substances, and the production of light beyond the brightness of the sun, have been

familiar experiments, in my laboratory. I have uniformly given Mr. Hare the full credit of the invention, although my researches with his instrument had been pushed farther than his own, and a good many new results added.

It is therefore with no small surprise, that in the Annales de Chimie et de Physique for September 1816 (a French Journal) I found a translation of a very elaborate memoir, from a scientific Journal published at the Royal Institution, in London, in which a full account is given of a very interesting series of experiments performed by means of Mr. Hare's instrument or one on the same principle, but without any notice being taken of Mr. Hare's invention or experiments or of mine; and the whole is exhibited as original. On a comparison of the memoir in question with Mr. Hare's and with my own, I find that very many of the results are identical, and all the new ones are derived directly from Mr. Hare's instrument with the following difference. In Mr. Hare's the two gases were in distinct reservoirs to prevent explosion; they were propelled by the pressure of a column of water, and were made to mingle, just before their exit, at a common orifice. In the English apparatus, the gases are both in one reservoir, and they are propelled by their own elasticity, after condensation by a syringe.

Professor Clark of Cambridge University, the celebrated traveller, is the author of the memoir in question; and we must presume that he was ignorant of what had been done by Mr. Hare and myself, or he would candidly have adverted to the facts.

Measures have been taken to set this matter right in Europe, but, in the meantime, whatever treatment the subject may receive there, it is proper that the American public should know, that Mr. Hare was the inventor of the instrument with which in Europe they are now performing the most brilliant and beautiful experiments, and that there are very few of the results hitherto obtained there, by the use of it, (and the publication of which has there excited great interest,) which were not, several years ago, anticipated here, either by Mr. Hare or by myself.

As I have cited only printed documents, or the testimony of living witnesses, I trust my countrymen will not consider this communication as indelicate or arrogant, but simply a matter of justice to the interests of American science, and especially to Mr. Hare.

BENJAMIN SILLIMAN.

Observations on the Topography of Louisiana. By JABEZ W. HEUSTIS, M. D. late Surgeon in the Army of the United States, &c. &c.

[From Physical Observations, and Medical Tracts and Researches, on the Topography of Louisiana.—New-York, 1817.]

IT is a fact confirmed by the general experience of mankind, that diseases are essentially influenced and diversified in their character and symptoms, by the local circumstances of climate and situation. In all inquiries, therefore, upon the subject of endemic diseases, the physical appearances and condition of the country are entitled to primary consideration. I shall, accordingly, dwell for a little upon the topography of this interesting portion of the union; a country, which, from the richness of its agricultural advantages, claims the pre-eminence over every other portion of the United States; and, in this respect, is certainly entitled to the flattering commendation of M. De Vergennes, who says, "la Louisiane est sans contredit, le plus beau pays de l'univers par la douceur de son climat et son heureuse situation."* Though this advantage of climate and happiness of situation, with respect to the acquisition of wealth, are, in a great degree, counterbalanced by the tax which nature imposes upon the health and lives of the inhabitants.

The state of Louisiana extends from about the 29 to the 33° of N. lat. and lies between 89 and 95° 30′ W. long. from Greenwich. This state is bounded west by the Sabine River, which separates it from the Spanish province of Taxas; north by the Missouri Territory; east by the Missisippi and Pearl Rivers; and south by the Gulf of Mexico. The general dimen-

*Memoir de M. De Vergennes sur la Louisiane.

sions of the whole country of Louisiana extend from the Missisippi to the Pacific Ocean.

The principal rivers of Louisiana are the Missisippi, Red, Ouachitta, Pearl, and Atchafalaya Rivers. Advancing westward, from the Atchafalaya and Plaquamine, we successively find the smaller rivers, Teche, Courtableau, Vermilion, Mermentau, Calcasu, and Sabine, besides other numerous small anastomosing Bayous. On the east side of the Missisippi, between it and Pearl River, are the Amite, which empties its waters into the Bayou Manchac, or Iberville River; the Tickfah, which empties itself into Lake Maurepas; and the Tangipao and Chifuncte, which fall into Lake Pontchartrain. All these latter are rivers of small dimensions, from 40 to 100 miles in length, which take their rise in the Missisippi Territory, and pursue a southwardly course. The Bogue Chito is another river, or branch of the Pearl, which unites with it twenty miles from its junction with the Rigolets, after pursuing a course of 80 miles. The Pearl is a larger and more important river, rising like the other streams west of the Missisippi, in the Missisippi Territory, and falls into the Rigolets, after running a distance of 180 miles. Many streams of considerable size besides the Bogue Chito contribute to augment the Pearl.

The country of Louisiana is separated into two portions, by that great ridge, called the Stony or Rocky Mountains, which gives rise to the Missouri and Columbia Rivers; the latter running west, and discharging its waters into the Pacific Ocean; the former taking a southern and eastern course, and uniting with the Missisippi. Hence it follows, that the country of eastern Louisiana, from the sources of the Missouri, Red, and Arkansas Rivers, &c. to the Gulf of Mexico, is an inclined plane, sloping to the south-east, the direction in which the rivers run. The Stony Mountains are destitute of trees, and have but here and there a scanty covering of herbage. The mountains gradually decline in elevation as they approach the Gulf of Mexico. A few hills of inconsiderable height verge along the western part of this state, about the 31° of north latitude, dividing the waters that flow into the Red River and Calcasu eastward, from those which pursue an opposite course and fall into the Sabine. North of 31° 30′, this ridge of hills runs nearly

equidistant between the Red and Sabine Rivers; becoming irregular and broken, they pursue this direction beyond the state of Louisiana. A chain of hills winds along the south bank of Red River, near the Panis village, giving the waters a southern direction towards the Gulf of Mexico. Another elevated ridge enters this state about the 93° W. long. runs a few miles south, reaches the bank of the Ouachitta in 32° 15′, ranges along that river, until it finally disappears, in 31° 42′ N. lat. and divides the streams which fall into the Red River from those which unite with the Ouachitta. An insulated hill, called Sicily Island, rises from the bank of the Ouachitta, below the mouth of Bœuf River, on the same side. This elevation is about 40 or 50 feet, and continues to preserve that height for some distance, when it gradually sinks into the overflown lands towards the Tensaw River. Below the town of Alexandria, at the rapids of Red River, the hills slope off in opposite directions towards Opelausas and the Ouachitta Rivers. There is an elevated ridge which commences at New Iberia, in the lat. of 30° 8′, and runs through Opelausas and Attacapas, in a north-western direction, being, apparently, a continuation of the mountains that give rise to the Red and Arkansas Rivers. Avoyelles, at the junction of the Red with the Missisippi River, is an elevated tract of prairie, about 16 miles long and three broad, rising to the height of 15 or 20 feet above the general level of the country. These are all the hills worthy of notice in the state of Louisiana; the rest of the country is either a prairie or morass.

The land of this state decreases in fertility as we proceed westward from the alluvial tract of the Missisippi. Immense prairies, or natural meadows, then open to the view, and constitute the greatest portion of Louisiana. These prairies extend in a north-westerly direction, from the Gulf of Mexico to the Stony Mountains of the Missouri, and to the polar regions. Here and there these plains are intersected with strips of timber land, bordering the streams, but more than four-fifths of the country is prairie. The northern portion of this tract, watered by the Missouri, is more fertile and productive than that of the southern, lying in the vicinity of the Gulf of Mexico. In no situation, however, is it well adapted to agriculture; and nature seems to have intended it as a never-failing source of life and

enjoyment to the herbivorous animals of the American Continent. Though possessing a greater degree of fertility, these plains have no inconsiderable resemblance to the desert steppes of Asia, north of the Caspian and Aral Seas. In this wild region, with the exception of a few well watered spots, this arid country presents a dreary expanse, extending from the state of Louisiana to the Rio Gila and the eastern ridge of the Californian Mountains. Though affording an inhospitable residence to man, it, on that very account, gives greater security and protection to those wild animals that shun the society of their common enemy and destroyer. Here range innumerable herds of buffalo and deer, and other animals of the sheep and goat kind, whose constitutions enable them to resist the scorching droughts of this thirsty region.

Such, however, is the condition of animal existence, that few beings subsist solely for their own enjoyment, but for the purpose of affording gratification and comfort to others; more particularly to man, the lord of the universe. Even here in this wild, dreary, and forbidding region, nature has not opposed sufficient obstacles to prevent him from rioting in the carnage of those peaceful tenants of the desert. Leading a wild and vagrant pastoral life, the Hietans, like the Tartars and wandering Arabs, following the herds, have no settled place of abode, but shift and adapt their residence to the migratory movement of these animals, who change their pasture whenever drought and scarcity of water compel them to seek a more favourable situation. The Hietans, who inhabit these regions, have tamed and domesticated the horse, and excel in the management of this noble animal. They are the only aboriginal inhabitants of this continent who have been gallant enough to attempt, and sufficiently skilful to withstand, the shock of cavalry instituted on the principles of European tactics.* In this respect they resemble the Mexican troops of the Presides, according to the account of Baron Humboldt, who observes, "The Mexican troops of the Presides are exposed to continual fatigues. These soldiers are all natives of the northern parts of Mexico. They are mountaineers, of high forms, extremely ro-

* Pike.

bust, accustomed to the frosts of winter, and to the ardour of the sun in summer. Constantly under arms, they pass their lives on horseback. They often march eight or ten days over those desert steppes, without carrying with them any food, except the flour of Indian corn, which they mix with water, as they meet a spring or pond on the road. Well informed officers assert, that it would be difficult to find in Europe a troop more light and active in their movements, or more impetuous in their charge.*"

Here may these outcasts, and strangers from polite society, find a safe retreat from the encroachment of their white countrymen, who are not disposed to envy them the poverty of their enjoyments. Though poor in the estimation of civilized refinement, a serene sky, a temperate climate, and a pure atmosphere, give them the greatest of worldly blessings, the possession of health. An atmosphere uncontaminated with noxious exhalations, fanned with salubrious breezes, and purified by passing over the verdant herbage, diffuses health around them on its balmy zephyrs. Free from anxiety, and strangers to the pangs of disappointed ambition, and unmolested by corroding cares, hope deferred, or blasted expectation, in the possession of health, happiness gilds the unenvied life of nature's humble fondlings: whilst, in the refined societies of civilized life, how often do we see poverty and disease aggravate the misery of existence, and cause the unhappy patient to drain, to the very dregs, the bitter cup of calamity.

But leaving those wilds to the native inhabitants who possess them, and directing our view to the *state* of Louisiana, a different scene presents itself to our observation: the mountains gradually subside into plains, the arid prairie yields in many places to the more fertile tracts of alluvion, the earth is clothed with a richer covering of vegetable growth, and trees of a gigantic size indicate the existence of a more prolific soil. It is here that the Father of Rivers dispenses his fertilizing influence, in the annual inundation of the surrounding country. The spiral pine gives place to the umbellated cypress; the lakes, ponds, and streams are covered with the migratory water fowls,

* Humboldt's Political Essay on New Spain.

that annually and alternately visit the lakes of Canada, and the waters of the Gulf of Mexico.

A considerable portion of the state of Louisiana is unfit for the purposes of cultivation. The south-western part is principally prairie, whilst the southern, and much of that bordering on the river, is an impassable morass. At the mouth of the Sabine, which forms the western boundary of this state, the country exhibits the wildest state of desolation. A line of shell-banks extends along the shores of the lake, into which the Sabine river expands, at the distance of 20 miles from its mouth. These banks are covered with trees of a stunted growth; the surrounding country is a morass, for the extent of near 20 miles above the lake, at which distance trees begin to make their appearance. Throughout the whole extent of the southern boundary of Louisiana, the Gulf of Mexico is unapproachable in any other way than through the water-courses, except at three or four places west of the Atchafalaya, the whole coast being low, swampy, and impassable for some miles into the interior.

Between the smaller rivers which discharge their waters into the Gulf of Mexico, the country is intersected by prairies. Proceeding from the Atchafalaya River westward, we find, in succession, the Prairie Grand Chevreuil, which lies between the Atchafalaya and the Teche, occupying the high ground between the two rivers, beyond the reach of inundation; the Attacapas Prairie, between the Teche and Vermilion Rivers; and Opelousas Prairie, lying upon the west side of the Vermilion River. This prairie is of larger extent than either of the others, taking a direction from S. W. to N. E. and is 70 miles in length and twenty-five in width. We then meet with the Grand Prairie, Prairie Mamou, Prairie Calcasu, which extending from N. E. to S. W. is fifty miles long and twenty wide; and, lastly, the Sabine prairie, between the Calcasu and Sabine Rivers.

The soil of these prairies decreases in fertility as we recede from the Mississippi, becomes dryer, and less subject to inundation. The Attacapas prairie, along the margin of the Vermilion, is of a good quality, and well adapted to the cultivation of cotton, tobacco, indigo, corn, and rice. It is probable that

the sugar cane might also be cultivated to advantage south of the 30° of N. lat. Springs of water are not common in these prairies, though it is easily obtained by digging through the soft earth to the depth of from 20 to 50 feet. The Opelousas Prairie affords a vast and extensive range for cattle. It is principally from this immense meadow that the inhabitants of the country, and the city of New-Orleans, are supplied with beef. This prairie contains more than 1,120,000 acres; upon the calculation that five acres are sufficient for the annual production of a single animal, the number of 224,000 is afforded, which at the average price of ten dollars a head, yields an aggregate amount of 2,120,000 dollars a year. The Prairie Mamou is well adapted, and is now appropriated to the rearing of cattle. To give an idea of the extent to which this branch of husbandry is carried on, we may remark, that three gentlemen in the different provinces of Calcasu, Mamou, and Opelousas, are collectively in the possesion of nearly twenty thousand neat cattle, together with several hundred horses and mules.

A singular appearance is observable in the Prairie Mamou, which is, the existence of a number of little hillocks, resembling vegetable beds in a garden. These little beds are ten or eleven feet wide, and from ten to eighteen inches high. They appear to be the work of some small animal of the mouse or mole kind. These elevations possess more fertility than the other parts of the prairie, as indicated by the larger size and more verdant colour of the herbage, which occasions these meadows to exhibit an agreeably diversified appearance. A great portion of these prairies is sterile, and not well adapted to agricultural purposes. This is more especially the case with those in the western part of the state. Near the Missisippi and along the margin of the Teche River, the land is of a superior quality.

Iron is found in the upper and hilly parts of the state, and might be manufactured on the Little Missouri, and other branches of the Ouachitta, where the ore abounds. Salt plains are very numerous in Louisiana, which will render this necessary article cheap, in proportion as it is easily attainable. Near the sea-coast of the Prairie Calcasu, salt may be obtained in

any quantity. It is now manufactured to a considerable extent at the valuable salt flat on the Sabine River, at the works of Mr. Postlewaite, near Natchitoches, and is thence transported to Natches, New-Orleans, and other parts of the country.

As the Missisippi River is the largest, and of the first importance in the state of Louisiana, and as the physical appearance and phenomena of the country are, in a great degree, to be ascribed to the agency and effects of this voluminous stream, a more particular account of it may not be considered improper on the present occasion. Rising in the most northern parts of the United States, and augmented by the afflux of mighty rivers, it rolls its serpentine stream along the eastern border of Louisiana, and, passing through the lower part of the state, discharges its waters into the Gulf of Mexico.

To enable the reader to form a better idea of the country through which it passes after receiving the Missouri, the following table of the distances of various places on this river, is introduced.

	Miles.	Whole Distance.
From the Missouri to St. Louis,	14	14
St. Genevieve,	73	87
Kaskaskias River,	16	103
Grand Chain of Rocks,	75	178
Mouth of the Ohio,	15	193
New-Madrid,	75	268
St. Francis River,	240	508
Arkansas,	107	615
Yazoo,	241	856
Natches,	142	988
Loftus' Heights,	55	1053
Line of demarcation between the United States and Florida,	5	1058
Red River,	10	1068
Baton Rouge,	104	1172
New-Orleans,	136	1308
Fort Balize,	100	1408

From the Great Bend to Cape Girardeau, 157 miles, the Louisiana bank generally continues high, except the interval land on the immediate margin of the river; yet, throughout all this distance, it forms only a moderate elevated ridge, from one to four miles from the river. At Cape Girardeau it begins to assume the appearance of a rough and mountainous country. This continues fifteen miles to the Grand Towers, where the ridge is a perpendicular rocky precipice, 200 feet high. From the Grand Towers to the Grand Chain of Rocks, six miles, the land gradually descends to its general level, which it afterwards preserves without interruption.

From the Grand Chain of Rocks to Fort St. Philip, or Plaquemine, situated 70 miles below New-Orleans, a distance by the river of 1173 miles, the Louisiana bank is but a little higher than the ordinary level of the river. It preserves this height from a quarter of a mile to two miles wide; westward of which, throughout this whole extent, is a swampy country, from 20 to 50 miles in breadth. This bank is inundated every spring, and sometimes in the fall, and the superabundant waters of the river are thus diffused over the whole surface of the swampy low ground of the adjacent country, which, in many places, is so wet and miry, as to render it uninhabitable, and incapable of being cultivated. In all this distance of 1173 miles, there are very few spots on the narrow slip that forms the margin of the river, which afford a site sufficiently elevated for a town or village, that would be at all times safe from inundation. New-Madrid, the only town on the western side below Cape Girardeau, has been once inundated; and the street which was intended to front the river, has been washed away by the current. A considerable portion of the eastern shore is also subject to inundation, except in those situations where it is prevented by the projection of narrow bluffs and high lands. Of these there are 14 between the Ohio River and the Gulf of Mexico. The following table exhibits the names, distances, and breadth of these bluffs on the river, where they are known:

From the Great Bend to the		Miles.	Front.
	Iron Bank,	20	$\frac{1}{4}$
	Chalk Banks,	5	$\frac{1}{4}$
	Upper Chickesaw Bluffs,	154	1
	Second Chickesaw Bluffs,	11	1
	Third Chickesaw Bluffs,	26	1
	Fourth Chickesaw Bluffs,	33	10
	Walnut Hills,	253	
	Grand Gulf,	58	
From the Grand Gulf to the	Petit Gulf,	20	
	Natches,	77	25
	White Cliffs,	20	
	Loftus' Heights,	35	
	Little Cliffs,	103	1
	Baton Rouge,	24	

Throughout this distance, the banks on both sides are universally covered with forest trees. From Fort Plaquemine to the mouth of the Missisippi, a distance of 30 miles, the land upon both sides is a mere morass, or a marshy impassable prairie, skirted with small willows upon the margin of the river.

We meet with many islands in descending the Missisippi. There are 23 between the Great Bend and the Ohio, 33 between the Ohio and the Upper Chickesaw Bluffs, 51 between these and Natches, and 42 between Natches and New-Orleans. Some of these are five or six miles in length; but they are all low, and subject to inundation. They are undergoing continual change in their position and appearance, from the action of the river diminishing them in one part, whilst the deposition of new materials increases them in another. Their formation is effected in the following manner: A tree, in floating down, gets fastened by its branches to the bank or to the bottom of the river, where the water is shoal; against this obstruction, other trees, leaves, brush, and the mud of the river, are lodged, and, by continually accumulating, in a short time form a solid compact mass, in the form of an island; the upper end of which is constantly enlarged by fresh accumulation of those various substances, while the lower part is often undermined and washed away by the current: and in this manner,

many of these islands, by renovation and the accretion of fresh materials, are constantly ascending the stream.

The navigation of this river is not free from danger, and is attended with many difficulties; amongst which *sawyers*, *planters*, *falling banks*, and *bayous*, are principally worthy of notice.

Sawyers are the bodies of trees which, from their roots having become fastened into the bottom of the river, receive, from the pressure of the current, a constant vibratory motion. They frequently disappear from one to 20 minutes, and then raise their trunks with great swiftness, from one to 10 feet above the water. The unfortunate boat against which they may happen to strike, is immediately destroyed. *Sleeping sawyers* approach only within 12 or 15 inches of the surface, and from being concealed, are still more dangerous.

Planters are trees firmly bedded in the soft sandy bottom of the river. Some are perpendicular, others incline up or down the stream. At night they are peculiarly dangerous. The middle of the river is too deep to admit of the fixation of trees in the bottom, so as to be productive of any injury. They are only dangerous upon each side, about one third across the river.

Falling banks are parts of the banks so much undermined by the current, that pieces of them, frequently more than an acre in extent, are constantly falling into the stream. Boats are sometimes destroyed by them. They are also sometimes dashed in pieces on the upper end of the wooded islands, against which they are unavoidably forced by the excessive rapidity of the current.

Besides these dangers, against which it is impossible always to provide, even by day, and which render the navigation very unsafe by night, there is another, during the freshets, more formidable than either. Below Cape Girardeau, in consequence of the lowness of the adjacent country, the force of the inundation from the river has worn outlets or *bayous* in the banks, through which its waters are impelled with great violence. When a boat is passing one of these bayous, great care is necessary, in order to guard against the danger of its being

carried away by the current, and lost in the swamp.* Several of these bayous are properly branches of the main river, conducting a part of its waters to the sea. Bayou Chaffalaia, or Atchafalaya, commences three miles below the mouth of Red River, and pursuing a south-west direction, empties a part of the waters of the Missisippi into the Gulf of Mexico, near Vermilion Bay. In high freshets it is navigable for canoes the whole length. Bayou Manchac, or, as it is sometimes called, the Iberville River, is an outlet on the eastern side, 15 miles below Baton Rouge, which separates Florida from Orleans. It is navigable three months in the year, for boats drawing five feet water. During the greater part of the remaining nine months it is perfectly dry. It conveys a portion of the waters of the Missisippi, during freshets, in an E. S. E. direction, to Lake Maurepas; which is about twelve miles long and eight wide. This is connected, at its eastern end, by a short strait, with Lake Ponchartrain, which is about 35 miles long and 25 wide, and generally from 12 to 14 feet deep. This lake has several connexions with the Bay of Spiritu Santo. Bayou Plaquemine commences eight miles below Manchac, and Bayou Fourche 32 miles below Plaquemine; both are on the western side of the Missisippi, and communicate with the Gulf by several branches. Besides these bayous, which considerably diminish the volume of the river, the main branch of the Missisippi has three mouths, or, as they are called, passes. The *east pass* is 20 miles long, and has 16 feet water over the bar at its mouth. It is the pass principally used; and immediately above the bar, which is very narrow, there is water sufficient for a ship of the line. The *south pass* is 22 miles long, and the *south-west* 25. They both have about 8 or 9 feet water over the bar. A log fort, called Fort Balize, was partially constructed upon a plan of general Wilkinson's, at a great expense, on a little island, at the north side of the east pass. This fort was destroyed by the British in the late war. The block-house and two or three out-houses are still remaining in the vicinity of the ruined fortification. The land upon which they stand is a mere swamp, impassable except along a raised

* *Bayou*, in the Spanish language, expresses the diminutive of bay; but in Louisiana it is frequently applied to a creek or small river.

foot-way of communication. They now serve no other purpose than that of affording a convenient situation for the pilot of the port.

It appears from careful triangular measurement made at the Balize, Fort St. Philip, New-Orleans, and other places, that the medium width of the river is about 800 yards, or rather short of half a mile. The depth, however, compensates for its narrowness, being from 120 to 150 feet deep; and from the bar to the mouth of the Ohio, there is sufficient depth of water to float a ship of the line.

The *Devil's Race Ground* is a difficult and dangerous passage, 107 miles above the River St. Francis. The current is here very rapid, and the river is crowded with planters and sawyers. The *grand chain of rocks* extends in little clusters of islands quite across the river. Many of them are visible when the water is low. The spaces between these rocks are large enough to afford safe navigation to those who are acquainted with their situation. *The grand towers* lie nine miles above. The river here turns to the east. The west bank is a solid perpendicular rock, through which the stream has scooped out a basin 200 or 300 yards in length. In front of this basin stand several perpendicular columns of solid rock, of a circular figure, upwards of 100 feet high, which have hitherto withstood the force of the current. Forty miles above these is the Picket Island Passage, which is so full of snags, sawyers, and planters, as to render the navigation very dangerous at low water. These are all the obstructions below the Great Bend in the Missisippi.*

The usual current of the river is three miles an hour; when the water is very low, it is less; in ordinary freshets it is commonly four, and in the highest it never exceeds five. Ships are liable to much delay in passing from the Balize to New-Orleans. With a good wind they can perform the voyage in less than two days; but when opposed by head winds or becalmed, they are not unfrequently 15 or 20. Another difficulty is the narrowness of the bar, to cross which it is necessary to have a favourable wind, so that vessels are sometimes

* Morse's Geography.

detained nearly a month at the mouth of the river before they can put to sea. With a fair wind, vessels sail from New-Orleans to the Balize in 10 or 12 hours. It often takes from 60 to 80 days to perform a voyage from New-Orleans to Natches. Ships rarely ascend above this place. Boats descend from Natches to New-Orleans in one week, but are about three in returning. The steam boats, which have lately come into use upon the Missisippi, afford much greater ease and rapidity to the navigation. The principal branches of the Missisippi below its junction with the Missouri, are the Ohio from the east, and the Arkansas and Red Rivers from Louisiana.

The French, and a few Spaniards who yet remain, are professedly Catholics. They have but one cathedral. There is, however, a convent of Ursulans, to which is attached about 1000 acres of land, rented out in three plantations. At present the nuns do no exceed 10 or 12 in number, all of whom are French. Formerly there were about the same number of Spanish ladies belonging to the order; but during the period when it was expected that the province would be transferred to the French, they retired to Havanna. Young ladies are received as boarders by the neighbouring nuns, who instruct them in reading, writing, and needle-work. They have always acted with great propriety, and are generally respected and beloved throughout the province. With the assistance of an annual allowance of 600 dollars from the treasury, they always support and educate 12 female orphans.*

According to the census of 1766, the number of inhabitants in Louisiana amounted to 11,496; in 1804, to 35,932; and in 1810, to 97,401; of the latter number, the Territory of Orleans contained 34,311, and the Territory of Louisiana 51,538.

The inhabitants of Louisiana are chiefly the descendants of the French and Canadians. There is a considerable number of Americans and English in New-Orleans. The two German Coasts are peopled by the descendants of settlers from Germany, and a few French mixed with them. The three succeeding settlements up to Baton Rouge contain mostly

* Jefferson.

Acadians, banished from Nova-Scotia by the English, and their descendants. The government of Baton Rouge, especially the east side, which includes all the country between the Iberville and the American line, is composed partly of Acadians, a few French, and a great majority of Americans. On the west side they are mostly Acadians. At Point Coupee and Fausse River they are French and Acadians. A considerable part of the population of the Attacapas and Opelousas is American. Natchitoches, on the Red River, contains but a few Americans; the remainder of the inhabitants are French; but the former are more numerous in the other settlements on the river, viz: Avoyelles, Rapide, and Ouachitta. At Arkansas they are mostly French; and at New-Madrid, Americans. At least two fifths, if not a greater proportion of all the settlers on the west side of the Misisippi, in the Illinois Country, are likewise supposed to be Americans. Below New-Orleans the population is altogether French and the descendants of Frenchmen.

Literature is at a low ebb in Louisiana. There are no colleges in the state, and but one public school, which is at New-Orleans. The masters of this were formerly paid by the King of Spain. They taught the Spanish language only. It has been observed by Mr. Jefferson, that not more than half of the inhabitants are supposed to be able to read and write; and that of those, not more than 200, perhaps, are able to do it well. In general, the learning of the inhabitants does not extend beyond these two arts.

New-Orleans, in lat. 29° 57′ N. long. 90° 8′ W. from Greenwich, and 13° 9′ from Washington, is the only town of any considerable consequence in the whole of Louisiana. It was founded in 1717, and stands on the east bank of the Misisippi, 100 miles from its mouth, 1308 below that of the Missouri, and 1115 below that of the Ohio. It is on the south-west of the Island of Orleans, four miles from Lake Pontchartrain, with which it communicates by the Canal of Carondelet. The town is regularly laid out; the streets cross each other at right angles, and are generally about 40 feet broad. The side-walks are paved with bricks, but the middle of the streets is not paved. This neglect is a material inconvenience to the city, as the natural humidity of the earth renders it very

muddy in the spring of the year, and after falls of rain. It is an inconvenience, however, not easily remedied, as there are no stones within the distance of some hundred miles from the city. The houses of the three principal streets, Levee, Chartres, and Royal streets, near the river, are built chiefly of brick, plastered over with lime, or roughly stuccoed, and the roofs are made of slate or tiles. The back part of the town consists mostly of wooden buildings. New-Orleans extends along the Mississippi in the form of a parallelogram; its length, in the direction of the river, is 1320 yards, and its breadth 700 backwards towards the swamp. In the centre of the town, at the N. W. corner of Chartres and St. Peter's streets, stand the Cathedral, or Church of St. Lewis, and the Town-House, in front of which is an open square covered with grass. The Market-House is a fine brick building, situated on the Levee, nearly in front of the square which lies before the Cathedral, between St. Anne and Du Maine streets. At the south-east end of the town, stands a building occupied as a convent by a number of Ursulan nuns. Besides these public buildings, there are an Hospital, the Barrack-Buildings, a Custom-House, the Orleans, Louisiana, and Planters' Banks, Government-House, the District-Court, and Latrobe's Water-works.

The Levee, before the city, is upwards of 20 feet wide, and in dry weather, when the river is high, affords a pleasant walk; but in the summer and autumn it is rather to be avoided, on account of the offensive odour of the miasmatic exhalations of the corrupting filth left upon the banks after the falling of the water, and accumulated by constant addition from the city.

The city and suburbs of New-Orleans contain about 24,000 inhabitants. The proportion of whites and people of colour is nearly equal. Amongst the whites, the French are most numerous and wealthy. There are a few Spaniards and Portuguese, some Italians, and a number of Indians. From all which, it will readily be supposed that there must be a great diversity and contrast of complexion, language, and manners among the different descriptions and classes of society.

The Indians who reside in the vicinity of the town, are miserable outcasts from the Albania, Tunica, Chittemaches,

and Atacapas tribes. They wear but little clothing, and participate in all the vices of intoxication, riot, and debauchery.

The situation of New-Orleans possesses many and important advantages as a city, from the extensive communication which the rivers afford it with the northern parts of the United States. The Missisippi, and the great rivers connected with it, the Red River, the Arkansas, the Ohio, the Missouri, the Illinois, and their branches, open an extent of inland navigation, of which there is scarcely a parallel on the globe. The difficulty and delay in entering the mouth, and in ascending the river, deprives New-Orleans of many commercial advantages, which a more easy access would otherwise afford. The easiest and most usual mode for small vessels to transport their merchandise to New-Orleans, is to ascend Lake Pontchartrain to the mouth of Bayou St. John, where the goods are put into boats, carried up the bayou six miles, and through the Canal of Carondelet to the city. This canal is two miles in length, and leads from Lake Pontchartrain, by way of Bayou St. John, to New-Orleans, and is to be extended to the Missisippi. For this purpose 25,000 dollars were appropriated by Congress, in February, 1809.

Forest trees flourish in this state, in great abundance and variety. The following list contains the names of the principal part of the trees which are found in Louisiana:

Acer negundo,	Box Elder,
Acer nigrum,	Black Sugar Maple,
Acer rubrum,	Red Flowering Maple,
Amygdalus Persica,	Peach,
Andromeda racemosa,	
Annona triloba,	Papaw,
Betula lentea,	Black Birch,
Bignonia catalpa,	Catalpa,
Carpinus ostrya,	Iron wood,
Carpinus Americana,	Hornbeam,
Castanea parmila,	Chincapin,
Cerasus Caroliniana,	Laurier Almond,
Cerasus Virginiana,	Wild Cherry,
Citrus aurantium,	Sweet Orange,

Citrus medica,	Seville Orange,
Cornus Florida,	Dogwood,
Cornus Alba,	Swamp Dogwood,
Cupressus disticha,	Cypress,
Diospiros Virginiana,	Persimon,
Fagus Sylvestris,	Beech,
Fraxinus aquatica,	Water ash,
Fraxinus tomentosa,	Red ash,
Gledista monosperma,	Water Locust,
Gledista triacanthos,	Honey Locust,
Ilex opaca,	Holly,
Juglans amara,	Bitternut Hickory,
Juglans cathartica,	Butternut,
Juglans aquatica,	Swamp Hickory,
Juglans laciniosa,	Thick Shell-bark Hickory,
Juglans myristicæformis,	Nutmeg Hickory,*
Juglans olivæformis,	Paccan,†
Juglans nigra,	Black Walnut,
Juglans porcina,	Pignut Hickory,
Juniperus Virginiana,	Red Cedar,
Laurus benzoin,	Spicewood,
Laurus sassafras,	Sassafras,
Laurus Caroliniensis,	Red Bay,
Liquidamber styraciflua,	Sweet Gum,
Liriodendrum tulipifera,	Poplar,
Magnolia glauca,	White Bay,
Magnolia grandifloria,	Large Laurel,
Morus rubra,	Red Mulberry,
Morus scabra,	Spanish Mulberry,
Nyssa aquatica,	Tupelo,
Nyssa sylvatica,	Black Gum,
Pavia lutea,	Buckeye,
Pinus taeda,	Loblolly Pine,

* This tree, first noticed by Michaux, grows plentifully on the rich acclivities of hills in the western part of the Missisippi Territory, and west of the Atchafalaya, wherever the country is broken and fertile.

† The Paccan grows in immense quantities above Natchitoches, on the banks of the Red River, as also upon those of the Trinity, Brasos à Dios and Rio Colorado.

Pinus rigida,	Pitch Pine,
Populus angulata,	Cotton wood,
Platanus occidentalis,	Sycamore,
Quercus alba,	White Oak,
Quercus aquatica,	Water Oak,
Quercus falcata,	Spanish Oak,
Quercus ferruginea,	Black Jack Oak,
Quercus lyrata,	Swamp White Oak,
Quercus macrocarpa,	Overcup Oak,
Quercus obtusiloba,	Post Oak,
Quercus phellos,	Willow Oak,
Quercus rubra,	Red Oak,
Quercus tinctoria,	Black Oak,
Quercus virens,	Live Oak,
Robinia pseudacacia,	Black Locust,
Robinia pumila,	Dwarf Locust,
Robinia bistineau,	Bistineau Locust,
Tilia pubescens,	Downy Linden,
Ulmus Americana,	Mucilaginous Elm,
Ulmus rubra,	Red Elm,
Ulmus aquatica,	Swamp Elm,
Ulmus alata,	Large-leaved Elm.

The soil and climate of Louisiana, though very fertile and congenial to the plants naturally adapted to the country, do not admit of that variety and excellence of grain, fruits, and culinary vegetables, that is found in the northern states.

Rice is one of the staple commodities of the country. This article is cultivated in abundance on the low lands near the Missisippi, and smaller streams. The land below New-Orleans is particularly adapted to it, and it is there almost exclusively substituted in the place of flour. Many families taste no other food throughout the year than rice. Certainly, if the eating of this grain could have any effect in producing blindness, as has been alleged, it could not fail to manifest its pernicious influence among those persons who are habitually accustomed to its use: and yet the daily and habitual consumption of this article is here found to be perfectly innocent. Rice has an advantage over maize and the other articles of agricul-

ture, since it can be raised in situations too wet and marshy for the cultivation of those substances. Ten or fifteen barrels of rice may be considered as an ordinary crop for an acre of ground. The common price of a barrel of rice in Louisiana, may be estimated at six dollars.

From the Balize to the English Town, 15 miles below New-Orleans, the country is unfit for the habitation of any human being, and adapted for the residence only of alligators, snakes, frogs, and other reptiles and amphibious animals, who claim possession by the right of nature; yet, even in this last place of creation, do we here and there see the habitation of man, amidst the society of these abominable objects. We here behold a few poor, wan, and copper-coloured creatures, who exist by the cultivation of rice, and by raising a few hogs and a little poultry, scattered along this marshy coast, in detached situations of three, four, or more miles asunder, according as they may find a spot of sufficient firmness to support a habitation. Wherever they fix their abode, it is necessary to prevent the inundation, by leveeing the banks of the river, which obliges the water to run off by the collateral passages.

Maize (Indian-Corn) is not raised to any considerable amount in Louisiana; the farmers, finding it more to their interest to receive their supplies of this article from the states of Ohio, Kentucky, and Tennessee, turn their attention to the cultivation of the more profitable commodities, sugar-cane, rice, cotton, indigo, and tobacco: the two latter articles, however, at present, receive but little attention. Besides, the heat of the climate renders maize less productive in Louisiana than in the northern states. In this country, the range that seems to be best adapted to maize, is included between the 35° and 40° of N. lat.

Nor is the climate of Louisiana well adapted to the raising of wheat; its cultivation has been accordingly neglected. The same observation may be made with regard to rye, barley, oats, &c.

The Irish potatoe, in this state, seems to be out of its congenial soil and climate; and generally degenerates in size and taste from the potatoe of the northern states. They might probably be raised of a good quality in the northern parts of the state, where the soil is more sandy, dry, and elevated.

Land of this description lies north of 31° N. lat. and is designated by the growth of oak and hickory timber. The inhabitants depend, for the supply of potatoes, upon Kentucky and Tennessee, whence large quantities of this and other vegetables are brought down by water, during the fall and winter seasons. The climate of this state is well adapted to the growth of the sweet potatoe, (Convolvulus Batatas of Muhlen.) which is here raised in great plenty; though they are not so dry and well flavoured as in the Carolinas.

Culinary vegetables, in general, are inferior in Louisiana to those of the northern states. The carrot and the egg plant are of a good quality; but beets, parsnips, turnips, &c. soon degenerate. The heat of summer scorches and dries up the melons and cucumbers, which wither and die towards the end of June.

Some fine apples are produced in the upper part of this state; but the tree soon sickens, withers, and decays out of its congenial climate, under a scorching sun.

Several kinds of figs have been introduced, and flourish in this state; of these the large purple fig is the most excellent. North of 30° N. lat. it is unable to resist the frost, by which, even south of that parallel, it is sometimes destroyed. The yellow fig, from the south of France, is more hardy, and is the kind most generally cultivated on the Missisippi. This tree flourishes generally throughout the state of Louisiana, as it does also in the Missisippi Territory, wherever the whites, by their enterprise and industry, have made their establishments, and improved the face of the country. This tree lives as far north as the limits of the state extend; and, excepting the peach, is that which is most generally cultivated in our southern climate.

Peaches are found in the northern and western parts of the state, though not in any considerable quantity or perfection, being injured by the heavy rains which fall during the summer season, as likewise by the heat of the climate. The peach is much esteemed by the Indians; and there is scarcely a hut or wigwam in their country where this tree is not to be found. The traveller, in passing through the nations of the Cherokee, Chickesaw, Chactaw, and other tribes of Indians, frequently

finds the Amygdalus Persica encircling and shading the rude habitation of the American savage. When travelling through the wilderness, inhabited by those Indians, in the heat of summer, I have often been gratified and refreshed with this delicious fruit. As yet, peaches are scarce in Louisiana, and very few are brought to New-Orleans.

Below the 30° N. lat. the sweet orange is produced in abundance. The sour orange is found as far north as 33°. The pomegranate also flourishes in the southern part of Louisiana. If this description of tropical fruit-trees, instead of being brought from the West-Indies, had been transplanted from Spain and Italy, the climate of which more nearly resembles that of Louisiana, the change would have been considerably less, and they would thereby have accommodated themselves with greater facility to their new situation, and been better able to resist the cold of winter.

These fruits are of vast importance in the economy of health; there can be no doubt that they are materially connected with the welfare of the inhabitants. They are the antidotes which Nature, in her providential beneficence, has designed and provided as remedies against the diseases of the climate where they abound; illustrating the truth of the circumstance, that *ubi morbus, ibi remedium*, wherever disease prevails, there also exists the remedy.

The cherry, the currant, and the gooseberry, bear fruit with difficulty and in small quantity; and in a short time languish, and die.

Plumbs grow in considerable quantity and variety in different parts of the state, and are brought to the market of New-Orleans.

Grapes of different kinds, as the Vitis laciniosa, (Parsley-leaved Water Grape;) Vitis raparia, (River Grape;) Vitis verrucosa, (Muscadine;) are also common: of these, the latter is the most plentiful. The Cranberry is found upon the banks of the Mermentau. Tree Whortleberries, (Vaccinium arboreum) abound chiefly upon the dry upland, west of the Delta of the Missisippi; and the Vaccinium stamineum and Resinosum, both east and west of the same river.

Of all the plants of agricultural pursuit, which have receiv-

ed the attention of the inhabitants of Louisiana, none has been found so profitable as the sugar-cane. This plant may be cultivated to advantage as far north as the 30° 30′ N. lat. or from about the parallel of Baton Rouge to Fort Plaquemine, 30 miles from the mouth of the Missisippi; which extent, upon a moderate calculation, we may venture to say, contains 7,000,000 acres. Admitting that an eleventh part of this may be cultivated, there remains 636,000 arable acres; of which, allowing half for the cultivation and use of other necessary articles, there is left a residue of 318,000 for the sugar-cane. It is generally considered that an acre of ground will afford 1000 pounds of sugar; but, lest this calculation should exceed the actual quantity, we may make an allowance of 200 pounds, leaving a neat amount of 800 pounds per acre; this multiplied by the number of acres, gives an aggregate of 254,400,000 pounds, which, at eight cents a pound, would yield an annual revenue of 20,352,000 dollars to the state of Louisiana. This calculation is probably considerably short of the amount to which this branch of agricultural emolument will arrive at some future day; since, from the accounts of some respectable planters, it appears that the cane can be advantageously cultivated, even as far north as the Red River, which enters the Missisippi at 31° N. lat. It may also be reasonably presumed, that the increasing warmth of the climate, and the naturalization of the sugar-cane to the American soil and temperature, will considerably increase the saccharine quality of the plant.

Next to the sugar-cane, the cultivation of cotton is the most profitable article of agricultural pursuit; but upon this I shall not enlarge my observations.

A considerable part of the state of Louisiana is of secondary formation, produced by the abrasion and subsequent deposition of alluvial matter, and thus gradually encroaching upon the Gulf of Mexico. Trees are annually torn from their foundation by the undermining current of the river, and, floating down the stream, lodge at the mouth of the Missisippi, upon the bars, and in the shallow water. These bars are formed by the opposing currents of the river and the gulf. The Missisippi carries down the extraneous substances that

it has received in its passage, which, upon arriving at the mouth of the river, meet with an obstruction from the opposition of the tide; the latter, on the other hand, washes the sand and mud from the bottom of the gulf, and meeting with the river, occasions a degree of stagnation in the opposing columns, which permits the alluvial matters to subside. These bars and shallows gradually encroach upon the waters of the gulf, in consequence of the current of the river being stronger than that of the sea. The trees, logs, and bushes, brought down by the Missisippi, are constantly accumulating at its mouth; and at length, by the deposition of leaves, mud, &c. the interstices become filled up; and thus a new portion of land is formed, producing, in its turn, a fresh crop of herbage, shrubs, and trees. That such is the fact, no person will have a moment's hesitation to admit, who has ever visited the mouth of the Missisippi. He has there seen a long raft of mouldering trunks of trees, in different states of decay, adhering to the soft mud in the shallow water, and extending from the land a considerable distance into the gulf; and has thus observed the manner in which this physical change is gradually effected.

It is probable that all the land in the state of Louisiana, south of 31° N. lat. has been formed in this way. In fact, the whole of this state appears to be of modern formation. No rocks, or stones, or mineral substances, are found in the hills between the Ouachitta and the Missisippi. These hills present a regular stratified arrangement of alternate depositions of sand, argillaceous, and calcareous earth; intermixed with which are found shells and other exuviæ of marine animals.* Similar marine substances are also found in the banks of Red River and other places.

The immense shell-banks that are seen at the mouth of the Sabine, and also upon the islands lying between the Mobile and the Missisippi, some of them 50 feet in height, above the reach of the highest tides, and affording support to trees

* North-west of the Missisippi, about the northern confines of Louisiana, near the waters of the Derbane and Ouachitta, masses of loose sand-stone, lying parallel to the horizon, are found in some of the hills.

of considerable size upon their summits, evidently show that the waters of the gulf have receded considerably from their original boundaries.

It has been supposed that the Missisippi, as well as the other rivers of Louisiana, ran upon the apex of a ridge. This opinion is certainly erroneous. In no place within the alluvial tract are the banks of the river elevated more than six or eight feet above the general level of the swamp in its vicinity; a circumstance of no moment, when we consider that the river extends to the depth of more than a hundred feet below the surface of the swamp itself. Nor is this elevation of the banks above the general level of the country peculiar to the Missisippi; all the bayous and rivers of Louisiana exhibit the same appearance, in a greater or less degree, proportionate to the size of the streams; and is, in all, to be ascribed to the same causes. This circumstance is to be accounted for in the following manner. It is well known, that when the Missisippi is at its height in the spring, it undermines and sweeps away a number of trees which stand upon its banks; these float along with the current, till driven to the shore, and carried by the inundation upon the river's bank; here, from the shallowness of the water, they become entangled among the standing trees and bushes, and remain permanently fixed; bushes, sticks, leaves, and earth are mixed and deposited among them; and an imbankment of considerable height is thus, in time, effected. From what I have seen, I am satisfied that this is the manner in which this circumstance is to be explained. Below Fort Plaquemine the banks of the river are covered with the trunks of trees, some of them six or eight feet in diameter, for a considerable distance beyond the margin of the river. These are so closely compacted, that a person may walk for miles upon them, in the direction of the river, without touching the earth. By this natural process, at some future time, the banks of the Missisippi, from Plaquemine to the Balize, which are now nothing but a morass, will become as elevated and dry as they are at and above New-Orleans: when, also, an encroachment of equal extent will be made upon the Gulf of Mexico. There is another circumstance which may contribute, in some degree, to this effect; which is, the deposition of earth, that must

necessarily take place upon the water's losing the velocity of its motion immediately on leaving the channel of the river: for it is well known that the quantity of matter which a fluid is capable of holding suspended is increased in proportion to its agitation; whence it follows, that the heavier and earthy matters, which were with difficulty held suspended, will be first deposited in the vicinity of the river, whilst the lighter comminuted vegetable substances will be carried to a greater distance.

In this way, we may reasonably suppose that the whole of the flat and low country of Louisiana has been gradually formed. A considerable portion, even of the most northern parts of this state, is also of alluvial formation. The alluvial banks of the Red River, swelled in its passage by numerous streams, commence about the 33° of N. lat.; and we have already remarked, that, from the Grand Chain of Rocks, 75 miles above the mouth of the Ohio, the Missisippi annually overflows its banks. This inundation becomes more considerable and extensive as we advance towards the mouth of the river.

It is a circumstance worthy of observation, that the Missisippi, from the mouth of the Ohio to Baton Rouge, runs close along the edge of the eastern bluffs, which, in many places, are broken, and are continually falling in fragments into the river; while, on the other hand, in no place throughout this distance, does it come in contact with the bluffs which range along its western bank. Hence it appears that the bed of the Missisippi is slowly progressing towards the east. This circumstance is, no doubt, owing to the quantity of alluvial matter, mud, and sand, that is brought down by the larger rivers, (all of which enter the Missisippi from the west,) and is deposited upon the same side; thereby gradually filling up and diminishing the western portion of the channel of the Missisippi, and increasing upon the same side the extent of the valley through which the river runs.

The Red River and the Missisippi are skirted with an immense number of ponds and lakes in their vicinity, with which they hold communication by small channels and bayous, through which the water rushes upon the rise of the river.

These lakes serve as temporary reservoirs for the superfluous water, which would otherwise occasion a more extensive inundation of the country, and be productive of much injury and inconvenience to the farmer.

The water, in the greater number of these lakes, more especially in those bordering on Red River, is subject to an alternate flux and reflux of its current, occasioned by the rising and falling of the river. In the winter and spring, when the Red River is high, the water runs with considerable force into these lakes, which thereby become replenished, and so continue until the river begins to fall, when the current runs in an opposite direction. In this way, towards the close of the summer, the water in those lakes becomes exhausted and dried up, and their beds are converted into meadows, clothed with verdant and luxuriant herbage. The channel, running through the middle, however, always contains a quantity of water. On one side of most of those lakes, is a range of pine woods, the soil of which gives origin to salubrious and limpid streams, to the convenience and comfort of the inhabitants, who would otherwise be obliged to drink the impure water of Red River.

In the spring of the year, all the swamps in the vicinity of the Missisippi are inundated and filled with water; and the country, in many places, exhibits the appearance of a vast lake. During the summer season, as the river falls, these swamps are gradually exsiccated, so that in autumn they become nearly dry.

Every where, upon the sea-coast, and near the margins of rivers, throughout the state of Louisiana, the attention of the observer is lost and bewildered in the intricate mazes of natural canals, and communicating streams and lakes, that chequer the face of the country. Bayous and rivers inosculating with each other, wind in serpentine meanderings through the alluvial plains. This appearance is more remarkable near the coast of the Gulf of Mexico, where bayous, lakes, woods, and morasses diversify the confused scenery of nature.

We have already noticed the appearance of the country west of the Missisippi, where river is united to river by communicating lakes and bayous; and where soil, the most fertile,

imparts its prolific quality to the support of deep and luxuriant forests of maple, elm, willow, cotton-wood, &c. We have also noticed the different prairies that range between the rivers and the irregular and broken hills which begin to appear in the northern parts of the state; and that, excepting these, the whole country is a flat, alluvial, and marshy soil, formed by the annual overflowing of the rivers, which spread and deposit the ruins of the upper country upon the surface of the inundated earth.

Lakes are more numerous along the course of Red River than on the Missisippi; but the land in the former situation is not so low, and on this account they dry up during the summer season.

The Missisippi begins to rise in January, and continues to rise irregularly till the month of June, when it attains its height. Its fall is then very rapid; not unfrequently passing from its highest to its lowest state in fifteen or twenty days, or even less.

To prevent the inundation of the country, artificial barriers of earth, called *levees*, are raised upon the banks of the river; so that when the Missisippi is at its height, confined between the levees of the opposite sides, it is in many places eight or ten feet above the surface of the adjacent country. The river, thus restrained, sometimes bursts its artificial barrier, and breaks forth through the opening with uncontrollable violence, deluging and destroying the crops of several plantations. During the great freshets of 1811, 1813, and of the present year (1816), great injury was committed by the water bursting this artificial imbankment. This accident is liable to happen from two causes: viz. from a weakness and defect in the levee itself, or from the falling of the bank. Several acres of land are sometimes undermined by the silent gliding of the water; the first intimation of which is the sudden breaking and falling of the incumbent earth into the watery abyss, sometimes carrying along with it the houses and inhabitants of the place. Frequently the falling in of the bank is announced, and for some time preceded by a deep fissure or crack in the earth at the intended place of separation, giving the proprietor an opportunity to secure himself against the accident,

by surrounding the suspected portion with another levee upon the land side, and connecting it with the old one above and below the seat of danger. Notwithstanding this precaution, unforeseen accidents frequently occur, to the great injury of the farmer. It is probable, that if, instead of these levees, the natural canals or bayous were cleared of their obstructions at proper places, and new canals opened in situations where least injury would be done by the redundancy of the water thus carried off, the danger of inundation would be more effectually guarded against. It is, however, a matter of uncertainty, whether the rapidity of the stream would have force enough to keep these channels in a sufficient degree free from obstruction; and whether the trouble of clearing them would not be attended with more labour than the keeping of the levees in repair. One thing is certain, that in such a loose muddy soil, the levees can never afford perfect security. Besides, these artificial imbankments are productive of another physical evil, which is, that they prevent the surface of the country from becoming any higher by the deposition of fresh matter from the overflowing of the rivers' banks, and the consequent accretion of new soil. These are evils, however, to which man, in the gratification of his avarice or wants, must be content to submit.

From Natches to Baton Rouge the country exhibits the appearance of a finely cultivated garden, blooming with a luxuriant growth of cotton, and embellished with numerous well built edifices; whilst groves of orange-trees, clothed in perpetual green, adorn and beautify the landscape. There the pride of the forest, the magnificent magnolia, in aspiring grandeur, rears its majestic head, and by its stateliness and beauty claims the admiration of the passing traveller: its large and polished leaves exhibit a perpetual and unfading verdure; and its extensive, beautiful, and odoriferous blossoms perfume the air with their aromatic fragrance.

Perfect happiness and enjoyment are not the growth of a terrestrial soil: gratification and pleasure are alloyed with care and trouble; and such is the hard condition of human existence, that man is obliged to taste the mingled cup of sweet and bitter. These are moral reflections, as old as the

days of Homer, and faithful as the Oracles of Truth. Their application is easy on the present occasion. With all the advantages of wealth, which Louisiana affords to the inhabitants, it is unquestionably the most unhealthy portion of the United States. A vast alluvion of vegetable mould, and the decaying remains of animals, and of countless myriads of animalculæ, afford a fruitful hot-bed of corruption, quickened by the operation of a powerful sun, and teeming with the generation of sickness and of death.

Previous to the rise of the river, the surface of the earth is hard and dry; but as the river augments, the water rushes through the various bayous or natural channels, and finds admittance to the low grounds beyond the banks, rendering them very moist and wet.

Heat and moisture, by mutual co-operation, cause sickness to prevail with the greatest mortality in the months of June and July. Local circumstances, however, may prevent and vary this effect, as at New-Orleans, where sickness is most prevalent in August. This is owing to the number of ponds lying in the rear and vicinity of the city, which being filled with water throughout the early part of the season, thereby prevent decomposition from taking place in the morass beneath, till the exsiccation of the water is in a great degree effected by the falling of the river and the continuance of heat. From the same local circumstances, it happens, that a rainy season renders the city of New-Orleans healthy, by keeping the ponds filled with water, while it has a contrary effect upon the country generally; so that New-Orleans is healthier than the coast either above or below. In illustration of this circumstance, the classic reader will recal to his recollection the instance related in the history of Empedocles, the Sicilian philosopher and poet, who put an end to pestilential diseases among the Salacentii, by turning two streams of good water into the morass from which they originated.

The wind which generally prevails in Louisiana is from the south. With a few degrees variation, east and west, the current of air proceeds from that quarter for the space of more than six months in the year. These winds are always warmer than those from any other point of the compass, on account

of the atmosphere having been heated in the tropical regions. A south wind, concurring with humidity, is particularly uncomfortable and oppressive. The body is heated, relaxed, and enervated; sweat exudes from every pore; and the air being already saturated with moisture, is unable to receive and take away the perspiration that bedews the surface of the body.

The northern and more elevated parts of the state are less humid and subject to rain than the more sunken, alluvial, and swampy region of the southern portion.

In the month of February the returning spring announces its appearance by the soft fanning of the southern wind. A mild serenity of weather expands and reanimates the dormant germ of vegetation, whose green mantle, at this time, begins to clothe and beautify the face of nature. The month of February, in Louisiana, nearly corresponds, in its effects upon vegetation, to the month of April with us. The farmer and the gardener then return to the culture of the earth, and plant their seeds for the ensuing harvest. The south wind continues to prevail in the month of March, sometimes alternating with sharp blasts from the north and north-west. The wind from the south is frequently accompanied with copious showers. An increase of southwardly winds, accompanied with a greater degree of heat, ushers in the month of April. The nights still continue cool, and in the northern parts of the state, the crops of cotton, in this month, have been sometimes injured by the frost. The growth of the vegetable world, aided by the occasional refreshment of gentle showers, proceeds with rapid strides. A mild temperature of air and serenity of weather afford enjoyment to man; while, at the same time, he beholds with a degree of complacency bordering on delight, the rich, verdant, and flowery prospect which every where adorns the face of creation. The nights, as yet, are comfortably cool. During the month of May the winds shift more to the east and west; the heat increases, and becomes uncomfortable; vegetation proceeds rapidly towards maturity, and culinary vegetables are now in the height of their perfection. In June, the temperature of the weather is hotter and more oppressive. Showers are less frequent, and vegetation often languishes and withers for want of rain. The soil being light and spongy, retains the

water but a short time; and the surface of the earth becomes exsiccated into a hard dry crust. The month of July is sultry and oppressive. The wind from the south and south-east brings frequent showers of rain; which descends in inundating torrents, preceded and accompanied with loud peals of thunder and vivid flashes of lightning. The heat continues to prevail, with little variation, throughout the months of July, August, and September. It is at this season that the powerful sun shines forth with sickening beams upon the hot-bed of mouldering creation, and excites into activity the miasmatic agents of disease and death.

During the hot months of summer the thermometer ranges from 80 to 87°, and not unfrequently rises to 90°, or even higher. Man languishes under the oppressive heat; and through the day his clothes are constantly wet with sweat exuding from every pore of the body. Though the heat of the day is oppressive, the nights are cool and refreshing. This is owing to the humidity of the atmosphere, occasioned by the quantity of aqueous vapour exhaled, during the day, by the burning sun, from the humid earth. As soon as the bright luminary has sunk beneath the western horizon, the dew falls in copious quantity, and by its density abstracts the heat, and affords a comfortable coolness to the body. At the same time, the vapours are collected over the Missisippi and other streams, in the form of a thick fog, of such a degree of density, as to render objects invisible at the distance of 30 yards. They commonly rise only to the height of 30 or 40 feet. These *low hung vapours, motionless and still*, remain during the night undisturbed by a breath of wind; and in the morning, as soon as the sun begins to exert his influence, and calls forth the breeze, they may be seen rising by degrees above the surface of the water, suspended between the earth and sky, till, at length, dispersed and scattered by the god of day, they vanish in thin air.

The winter is cool, with frequent, strong, and chilling winds from the north and north-west. The thermometer, during this season, fluctuates between 45 and 56°. Rain is frequent, rendering the country wet and miry. Frost is very seldom observed as low as New-Orleans, and snow never; though the latter is sometimes seen in the northern parts of the state, and frost

often; where the crops are sometimes injured by it, even in the month of April. At and below New-Orleans, the cold is never sufficient to stop the growth of lettuce and radishes, which are always best in the winter season. Cabbages, as if by instinctive consciousness that the cold of winter is not sufficient to injure their expanded leaves, after the first year cease to head.

One of the greatest torments that was ever sent to afflict man for his iniquities in this world, is the musquetoe. This tribe of tormentors begin to swarm with the returning heat of the season in April, and continue their annoyance till they are stiffened and benumbed by the cold of November. As soon as the evening shades begin to prevail, the air is thickened with swarming myriads of these venomous insects, that arise in clouds, from the meadows and marshes, like volumes of dust in the deserts of Arabia. Their murmuring tinkling singing is so strongly associated in the mind with the disagreeable sensation of their bite, that their noise is rendered far more unpleasant than the most discordant music, the pealing thunder, or the rattling storm. Without the protection of screening curtains to defend him from the unremitting intrusion of these active and vigilant attendants upon man's sleeping moments, as well might he endeavour to seek repose upon a bed of thorns. Blood is their cry; nothing but blood will quench their thirst and satisfy their sanguinary appetites. Compared with them, the musquetoes of the northern states are mere gnats. Furnished with a bill like iron, they perforate the toughest hide, and drink the crimson stream of man and beast.

It is well known that musquetoes and other noxious insects are most numerous in wet and marshy places, where ponds, lakes, and morasses diversify the face of the country; and where morbific miasmata are exhaled in greatest quantity, and contaminate the atmosphere. It may therefore be considered as an indication of nature, that wherever those insects are very numerous, there also unwholesome exhalations prevail, inimical and dangerous to health, and destructive to human existence.

The chigoe is another troublesome insect in Louisiana, as well as in the other southern states, but far less common than the musquetoe. It is a sort of small flea, but little larger than

a cheese-mite, bred in the dust and in the chimney-corners. Without being perceived, these insects insinuate themselves under the skin of the feet and about the toe-nails; where a little bag, about the size of a small pea, is formed around them before they are discovered. This bag forms the nidus of the parent chigoe; that appears through the skin of a bluish colour, and is surrounded with an innumerable multitude of young animalcules contained in the capsule. From being suffered to remain, these chigoes multiply by generation in the skin and under the nails, and the young broods, dispersing, extend their habitations in every direction. These animals are particularly troublesome to the bare-footed negroes. In removing them, care should be taken not to break the bag in which they are contained; the hole may then be filled with tobacco-ashes.

The stingray is also worthy of notice, on account of the wounds which the men sometimes receive from its poisonous tail, by accidentally treading on this fish, which lies in shallow water, along the shore of the Gulf of Mexico. To obviate any dangerous consequence, the puncture should be dilated with a knife and touched with lunar caustic.

The centipede, mokason, rattlesnake, &c. also deserve to be noticed among the noxious animals and reptiles of Louisiana; but my limits do not permit me to enlarge upon the subject.

With respect to animals used as food, it may be observed, that, in general, the flavour of their meat is less pleasant to the taste than that of the northern states. We may make an exception of their mutton, which is by far the best meat the market of New Orleans affords, and appears superior to that of the north: but whether this superiority is real or only comparative, as being so much more excellent than the beef, I am unable to determine. The impure water of the Missisippi affords but a small variety of fish; scarcely any are caught but the cat-fish, which is very large—sometimes weighing 60 or 80 pounds. This fish, though eatable, is by no means delicious.

Some Observations on a Species of Pulmonary Consumption, very frequent in Great Britain. By Alexander P. Wilson Philip, M.D. F.R.S. Ed. of Worcester.

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To many physicians there will probably be nothing new in the following observations; but this remark I believe will not apply to the greater number of medical men, because it is very common for the different species of pulmonary consumption to be regarded as the same disease, and treated in the same way; nor is it probable that the species which I am about to consider will be generally distinguished till some separate treatise, which as far as I know has not yet appeared, calls the attention of the public to it; yet it will be evident, I think, from the following observations, that its nature is very different from that of other species of the disease; and that while, under the common treatment, it is nearly as fatal as these species, under that which is suited to it, its progress may generally in the earlier, and sometimes even in the more advanced stages, be arrested.

I shall, in the first place, point out the symptoms by which this species of pulmonary consumption is distinguished; then make some observations on its causes, and point out the analogy, which exists between it and many diseases apparently altogether of a different nature; and in the last place, I shall detail the plan of treatment, which I have found most successful in it.

Of the Symptoms.

I had occasion, twelve years ago, to mention this species of consumption and the plan of treatment adapted to it, in the second edition of my treatise on Febrile Diseases. Since that time it has particularly attracted my attention. It cannot therefore, I think, fail to be of some use to those whose attention has also been directed to it, to see the observations I have been led to make in so many years' pretty extensive experience of it; for there are few diseases so frequent in the

part of England in which I reside, and indeed I believe, in most parts of Great Britain. To those whose attention has not yet been particularly directed to it, any observations on the subject must be useful.

It is not my intention to give a detailed account of the symptoms of this species of phthisis. I shall only mention the symptoms and modifications of symptoms by which it is distinguished. Contrary to what is usual in other species of the disease, the spirits from the beginning are generally more or less depressed, and the countenance is more sallow than usual. The cough at first is generally dry, or the patient brings up a little mucus after a severe, and often long continued fit of coughing, which seems to be rather the effect of the irritation of coughing than any thing which had previously existed in the lungs; for the cough in this species of consumption, particularly in its early stages, frequently comes in violent fits, in the intervals of which the patient is often but little troubled with it. These fits are particularly apt to occur after he has eaten, especially if he has eaten a great deal, or any thing by which the digestion is disturbed, and on lying down. In many instances they are most apt to come on when he lies on the left side, sometimes when he lies on the right. I think in almost all cases, they are least apt to occur in the recumbent position, when the patient lies on the back with the shoulders a little raised; and it often happens in the more advanced stages, long before the strength is much exhausted, that this is the only position in which he can lie without inconvenience. As in all other forms of phthisis, so in this it is common for the cough to be troublesome for some time after awaking in the morning.

As the disease proceeds, the cough becomes more frequent, returns less decidedly by fits, and is attended with a more copious expectoration. In all these respects there is of course considerable variety in different cases, but in almost all the general character here pointed out may be observed. The matter expectorated is at first limpid and glairy; by degrees we see intermixed with it small portions of an opake pus-like substance, the proportion of which in the progress of the disease increases; and in some cases the quantity expectorated is

astonishing, often much greater in proportion to the severity of the other symptoms, than in other species of phthisis. I have often seen half a pint or more of pus-like matter mixed with tough phlegm expectorated daily, when the other symptoms were comparatively mild. In other species of phthisis, very copious and long continued expectoration of pus-like matter is less common. In them such copious expectoration generally arises from the bursting of a vomica. The matter it contained, if not sufficient to occasion suffocation, being brought up, the quantity expectorated is again reduced till another vomica bursts.

Bloody expectoration is by no means uncommon in this species of phthisis. Blood often appears early in the disease mixed with the colourless phlegm. After the pus-like expectoration commences, if blood has not previously appeared, it is much less apt to appear than in other forms of the disease. If it even appear in small quantity after this stage commences, the case generally proves fatal. While the blood is mixed only with a transparent fluid, there may be good hopes of recovery, certainly better than under the same circumstances in any other species of phthisis. A similar observation applies to the pus-like expectoration. If there be no admixture of blood, there may be good hopes of recovery, if the disease has not lasted long; and certainly much better than under the same circumstances in other species of it, though expectorated matter is less apt than in these to assume a sanious appearance; but when this occurs, it seems to indicate nearly as much danger as in them. If this happen under the proper treatment, there is no hope. Nearly the same may be said of every admixture of pus-like matter and blood occurring under these circumstances.

I here wave all discussion respecting the means of distinguishing pus and mucus. In my treatise on febrile diseases, I have considered the question at length. It is necessary in practice to have means of judging independent of nice experiments. Whether the matter I call pus-like, be pus or not, is not here the question; it is that to which the observations, which I am about to lay before the reader, apply. The only criteria, which I have found necessary in practice, are its pus-

like appearance, and its sinking when so agitated in water as to separate it from the tough mucus, with which it is mixed. I am inclined to think that this substance is almost always real pus. But if we know what states of disease are connected with what appearances in the expectorated matter, it is of comparatively little consequence whether what we see be pus or not.

The breathing in the earlier stages of this species of phthisis, is sometimes more oppressed by the recumbent posture, than in other forms of the disease; and is more frequently attended with a sense of tightness across the pit of the stomach. The same observations which apply to the cough in the recumbent position, and after eating, apply to the dyspnœa; but it often happens in the early stages, that there is little or no dyspnœa; and there is very rarely, except in the advanced stages, that marked dyspnœa on exercise, which so frequently attends even the commencement of other forms of the disease.

There is often little or no pain. In many cases the patient is subject to a dull pain in the pit of the stomach, or pretty low down in the left side of the chest; more rarely, the pain is in the same part in the right side. There is hardly ever a fixed pain high in the chest, although in some cases there is an uneasy sensation and a sense of oppression under the sternum. The patient sometimes complains of darting pains in various parts of the chest, and frequently in more distant parts, particularly in the limbs, back and shoulders; and is often subject to headach.

The hectic fever in the earlier stages is hardly ever so completely formed as in other species of phthisis, and sometimes there is a copious purulent expectoration with but slight fever, and that not at all assuming the form of hectic, the skin remaining dry in the morning, and there being little or no evening exacerbation; a state of the symptoms hardly ever observed in other forms of the disease.

The emaciation is seldom so rapid as in other species of phthisis, but seems to keep pace with the state of the fever.

Such is the manner in which the symptoms common to all forms of phthisis are modified in this species of it, but a diagnosis resting merely on the modification of symptoms must always be fallacious; it is therefore fortunate, that in the

present instance, there is superadded to the usual symptoms of phthisis, others peculiar to this species, by which, with very little attention, it may always be distinguished; symptoms indicating a deranged state of the digestive organs. The patient is often distressed with flatulence and irregular bowels, the tongue is furred, the appetite for the most part, contrary to what is usual in other forms of the disease, much impaired, the fæces seldom well coloured, and the epigastric region more or less full and tender on pressure. These symptoms vary much at different times, but the patient is hardly ever free from them. The connection between them and the pulmonary symptoms is rendered evident by the latter increasing with the former; so that when the epigastric region is very full and tender, the cough and dyspnœa are more troublesome; and on the fulness and the tenderness subsiding, the pulmonary symptoms abate. Even the rising of wind from the stomach often, for the time, removes the tendency to cough.

The foregoing are the symptoms of the more early stages of that species of phthisis which I am endeavouring to distinguish, because I have found it requires a very different plan of treatment from other forms of this disease. In its advanced stages, it approaches more and more to these forms. All the symptoms, which more particularly indicate a tubercular state of the lungs, show themselves; the cough is more constant, and partakes more of the hacking kind; the breathing is more affected by exercise, the hectic is more completely formed, the fulness and tendency of the epigastric region are often lessened, and sometimes wholly disappear; which, if the pulmonary symptoms continue unabated, always, I believe, affords a fatal prognosis. The patient at length sinks with precisely the same symptoms as in other species of phthisis. In addition to these, particularly if the affection of the digestive organs has been neglected, some of the more prominent consequences of this affection sometimes show themselves, particularly dropsy of the belly, which I never knew to supervene in other cases of phthisis.

Of the Causes.

The species of phthisis which I am considering arises from all the causes of this disease, with the exception of those whose

operation is confined to the lungs themselves, the inhaling of dust, other diseases of the lungs, the bones pressing unequally on them, &c. yet its causes are not less numerous than those of other forms of phthisis. To compensate for the want of those causes immediately affecting the lungs, we have a numerous set of causes affecting the digestive organs. Drunkards, at that time of life which disposes to phthisis, frequently fall a sacrifice to this form of the disease; and those who have been long subject to severe attacks of dyspepsia, and what are called bilious complaints, are liable to it. In short, we perceive equally in its causes, as in its symptoms, its connection with the state of the digestive organs, from which it may be justly termed dyspeptic phthisis. It particularly deserves attention, that, in many families, this form of the disease alone appears. When this is the case, its fatal effects may generally, I believe, be prevented by carefully avoiding the causes which tend to debilitate the digestive organs, and watching the first approach of the disease.

Of the Appearances on Dissection.

The appearances of the lungs are generally much the same as in other cases of phthisis; but we almost always find at the same time, either a diseased state of the liver, or traces of disease having existed in it. In cases where the disease of the liver has been severe, and the patient has died as much of this disease, as of that of the lungs, I have repeatedly found those parts of the lungs in the neighbourhood of the liver, alone affected, the left side appearing sound or nearly so. In general, however, the affection of the liver seems to have little immediate share in the cause of death, and the patient lives, as in other cases of phthisis, till almost the whole lungs are rendered incapable of their function. Here, as in many other cases, we often have occasion to remark to what extent change of structure even in the vital organs may go without destroying life, when the change is very slowly effected; a circumstance which, perhaps more than any other, shows the resources in the structure of the body itself, against the effects of disease.

It is not at all uncommon in dyspeptic phthisis to find the spleen as well as the liver diseased. As the cœliac artery dividing into

three branches supplies the liver, stomach and spleen, may we not suppose that the pain so frequently felt in the left side and in the stomach in this form of phthisis, arises from more than the due quantity of blood being thrown into the vessels of these organs in consequence of the obstructed state of the liver? Is it owing to their being supplied by the same artery, that we so frequently find a diseased state of the liver and spleen in the same subject, and that inflammations of these organs so frequently alternate with each other? I have repeatedly seen the inflammation pass from the one organ to the other, and back again to that first affected.

Of the Nature of Dyspeptic Phthisis.

It is impossible to observe even in a cursory manner the symptoms of this disease, without remarking that the state of the lungs is connected with that of the digestive organs. Its causes we have seen afford the same inference, and in those who die of it, I have just had occasion to remark, we very frequently find a diseased state, or proofs of a diseased state having existed in one of the organs of digestion, whose intimate sympathy with the others, numberless observations prove. A question of the first importance in the treatment of this disease here arises. What is the nature of the relation observed between the affection of the lungs and that of the digestive organs in this species of phthisis? is the one a consequence of the other, or are they simultaneous affections arising from a common cause? they are not simultaneous affeotions, for the one always precedes the other. In by far the majority of cases in which both the lungs and digestive organs are affected, the affection of the digestive organs precedes that of the lungs. In some instances we find the affection of the lungs the primary disease. But in these, the case does not assume the form above described, but that of simple phthisis; and the hepatic affection, which is always the most prominent feature of this derangement in the digestive organs, does not show itself till a late period of the disease, and then little if at all influences the essential symptoms.

We often observe the first of these forms of the disease arise from causes evidently acting on the digestive organs,

and as far as we can perceive in no degree on the lungs, and the last from causes evidently acting on the lungs, and in no degree on the digestive organs.

It seems to be a necessary inference from the preceding facts, that a diseased state of either set of organs may produce that of the other. But the tendency of disease to spread from the digestive organs to the lungs is much greater, than that to spread from the latter to the former. We often see a slight degree of derangement in the digestive organs produce cough and other pulmonary symptoms, and derangement seldom exists in all the digestive organs without producing more or less of these symptoms: whereas it is only after disease has advanced very far in the lungs, that it is apt to spread to the digestive organs, and in the greater number of instances it proves fatal without spreading to them.

When to these circumstances we add, that all the peculiarities of those cases of phthisis, which are from the commencement accompanied with disease of the digestive organs, may be easily explained by the existence of this disease; and that, as I shall presently have occasion to point out more at length, every thing which relieves this disease, at the same time relieves the pulmonary symptoms that attend it, the inference appears to be unavoidable, that in the species of phthisis which is the subject of this paper, the pulmonary disease arises from that of the digestive organs. It is not to be overlooked, however, that it is in those most disposed to pulmonary affection that disease of the digestive organs most frequently produces it. We consequently see this species of phthisis most apt to occur in the same habit which disposes to other forms of that disease. On the other hand, when the digestive organs are naturally weak, or powerful causes of disease in them have existed, particularly the free use of spirituous liquors, we often see it occurring in habits apparently least disposed to pulmonary affection.

It will place in a clearer light what has been said of the nature of the disease before us, to take a cursory view of the sympathy which exists between the state of the digestive organs, and the principal seat of derangement in some other diseases. Let me here refer to a work, which no physician, whatever

may be the extent of his experience and the accuracy of his observation, can peruse without advantage, although the modesty of its author has induced him to address it only to those belonging to his own branch of the profession; I mean the work of Mr. Abernethy, entitled "*Surgical observations on the constitutional origin and treatment of local diseases.*" I believe that experience has led many others to similar views, but no other person has laid them before the public in the way in which Mr. Abernethy has done, and those physicians whose attention has been directed the same way must be happy to see in Mr. Abernethy's work, a confirmation of their own observations; and such a confirmation as they were not likely to receive from the work of a physician. The physician's attention is directed to internal disease; there his inquiries naturally begin. Mr. Abernethy's, for a similar reason, began with external disease, and I believe every physician circumstanced as I was, will feel as I felt on reading his work. I unexpectedly met him on a road where I did not expect to meet a surgeon, but where the assistance of a surgeon was of greater consequence to me than that of any physician could have been. From local, he was unavoidably carrying on his observations to general diseases. The sympathies in question so connect them that it was impossible for him to do otherwise. From general, I was, for the same reason, carrying mine on to local diseases. In the case of dyspeptic phthisis which Mr. Abernethy relates, the reader will find the principle of the treatment which I have employed in phthisis for more than twelve years, as many medical men of this neighbourhood have witnessed; and the following cases which occurred to me before I read his work, or was acquainted with his opinions, and which I shall relate as concisely as I can, will afford a confirmation of these opinions and of the practice founded on them in local diseases. I mention these cases, because like Mr. Abernethy's case of phthisis, they tend to confirm the accuracy both of his observations and mine; for surely no stronger confirmation can be required of any opinion, than two observers wholly unconnected, setting out from the most opposite quarters, and meeting in the same point. My plans of practice are not precisely the same as Mr. Abernethy's, and in particular the mode of giving

mercury in internal disease, which I have found most successful, is different from his, but the general principle is the same.

A gentleman consulted me for severe pains in the legs, for which he had been treated unsuccessfully for two years. There was no reason to suspect syphilitic affection. I found his digestive organs deranged, and the epigastric region tender on pressure. He took a grain of blue pill combined with stomachic and opening medicines three or four times a day, and was cured in a few weeks. A gentleman had sores continually breaking out on various parts of the body which had proved very obstinate, for which he had been advised to go through a regular course of mercury. The digestion was deranged, and the epigastrium tender. I dissuaded him from any thing like a regular course of mercury. He took stomachic and opening medicines, with a grain of calomel every second or third night, and was cured in about a fortnight. A lady after repeated attacks of illness remained very weak; glandular swellings appeared in different parts of the body, and it was feared that a general breaking up of the constitution was about to take place. The appetite failed, the bowels were disordered, and the epigastrium was tender. She took sometimes a grain of blue pill two or three times a day, with stomachic and opening medicines, and at other times either a few grains of blue pill, or one grain of calomel, according to the state of the bowels every second or third night; no application being made to the glandular swellings, but occasionally two or three leeches when they were tender on pressure. In about three months her complaints disappeared under this plan of treatment, nothing but a depression of spirits remaining, which was removed by change of air.

In one respect Mr. Abernethy's mode of giving mercury in the cases above alluded to, and that to which I have been led in internal disease, arising from the sympathy of other parts with the digestive organs, agree. It is from small and undebilitating quantities that good effects are to be expected; in such cases, given otherwise it debilitates the digestive organs, and often thus increases the disease. The chief difference in our modes of giving it is, that he gives large doses at long intervals, I give minute doses at short intervals. This difference

has probably arisen from the nature of the diseases in which we have chiefly practised. Since I became acquainted with Mr. Abernethy's plan, I have tried it in internal disease, but have not found it so successful as that which I have been accustomed to pursue. Of the comparative effects of these plans in local diseases, I have not had sufficient opportunities of judging; and Mr. Abernethy does not mention his having tried the plan which I shall presently have occasion more particularly to lay before the reader.

Mr. Abernethy mentions other internal diseases, particularly those of the head and heart, caused by the deranged state of the digestive organs. I have repeatedly seen his observations on those diseases confirmed, and could relate several cases in which the patient had for years laboured under symptoms of *angina pectoris*, and had been treated for this disease, in which the symptoms yielded in a few weeks to small doses of blue pill combined with stomachic and opening medicines. In such cases we must of course suppose, that no organic disease of the heart had yet supervened. His observations on the brain are well illustrated by two excellent treatises lately published by Dr. Cheyne*, and Dr. Yeates†, on the diseases which has been called hydrocephalus internus. It seems surprising that the immediate connection of this disease with the state of the digestive organs should so long have escaped physicians.

It is not meant that hydrencephalus, as Dr. Smith‡ more correctly terms it, always arises from affections of these organs. In many instances it evidently arises from causes acting on the brain itself; but were I to speak from my own experience, I should say, that in at least five cases out of six it arises from the former cause; and that, in all cases, preserving a proper state of the digestive organs is the best means of prevention; for even where it arises from other causes, their tendency

* A second Essay on Hydrocephalus Acutus or Dropsy in the Brain, by J. Cheyne, M.D. &c. Dublin, 1815.

† A statement of the early symptoms which lead to the disease termed water in the brain, &c. in a letter to Martin Wall, Esq. M.D. &c. by G. D. Yeates, M.D. &c. London, 1815.

‡ A treatise on hydrencephalus or dropsy of the brain, by J. C. Smith, M. D. &c. London, 1814.

to produce it will be greater or less according to the state of these organs.

The effects of the sympathy which exists between different parts of the animal body in the production of disease, does not seem to have obtained the attention it deserves. It is well known that nervous affections will, if I may use the expression, mimic the symptoms of almost every disease, but it does not seem to be generally admitted, although I think we have sufficient proof of the fact, that if this mimic disease is kept up for a certain length of time it will be converted into the real disease, let the cause which produced it be what it may. I cannot chuse a more striking instance to illustrate this observation, than one intimately connected with the form of phthisis which we are considering.

In the 43d, 44th, and 45th sections of Morgagni's 21st epistle, the reader will find the pleuritis verminosa treated of at some length. He mentions one case in which all the symptoms of pleurisy were well marked, that terminated favourably by a bloody vomiting which brought up a lumbricus. We might in this instance attribute the relief obtained rather to the loss of blood than the expulsion of the worm; but he refers to a paper of Pedratto on the pleuritis verminosa, where the relief obtained by the expulsion of worms from the stomach and intestines, particularly from the former, is unequivocally proved. It there appears, that all who vomited the worms or passed them by stool recovered, while those who did not, died. All the common means of treatment in pneumonia failed, anthelmintics alone were successful. While the expulsion of worms from the *primæ viæ* immediately removed the disease, it is impossible for us to believe that real inflammation of the lungs had existed; yet in those in whom the disease proved fatal, the same appearances were found in the thoracic viscera, as in those who die of other forms of pneumonia. Thus disordered digestion produces palpitation and syncope, and if these symptoms continue to recur for a great length of time, they end in real disease of the heart. Thus the same cause produces drowsiness and inability, which if long continued, ends in real disease of the brain. They produce cough and dyspnœa, and, if long continued, real disease of the lungs. In all these and many similar

instances, no real disease seems at first to exist in the parts sympathetically affected. We must suppose, however, that some degree of debility or aptitude to disease exists in them, which determines the sympathy to affect them, in preference to other parts, with which the part originally affected equally sympathises; or there may be something in the original affection, which we cannot trace, that determines it to sympathise more with one part than another.

We see the same law obtaining in every instance: when affections of the liver produce pain in the shoulder, there is no disease in this part; the pain is merely sympathetic; we may press and rub the shoulder, the patient feels no more uneasiness from it than he would in the other shoulder; but after the pain has continued for a considerable time, the shoulder itself becomes affected. The patient cannot bear to have it pressed, and sometimes cannot lie upon it. When inflammation spreads from the intercostal muscles to the lungs, it does not traverse the pleura, reaching the lungs by the fold which reflects this membrane over them; it passes at once from the pleura of the ribs to that of the lungs, between which there is no direct communication either of vessels or nerves, for this often happens previous to any adhesion having taken place. Why is inflammation of the bowels as apt to spread to the contiguous bowels, with which they have no immediate connection, as to those parts which are in continuation with the diseased part? why does loss of blood by the application of a few leeches to the skin over an inflamed viscus, often give more relief than the loss of many times as much blood from a distant part? why does the skin over diseased viscera, even when no adhesions have taken place, frequently change its colour, especially as death approaches, as I have often witnessed? why do eruptions of the skin, often very slight, alternate with serious diseases of internal parts? it is needless to multiply such instances; whoever observes with attention the phenomena of disease will find them numberless. They are all referable to one law, by which neighbouring parts always, and distant parts often sympathise, independently of any direct communication either of nerves or vessels.

How we are to account for this sympathy I shall not here

inquire. It teaches us an important lesson in the prevention of disease, that the first beginnings of many sympathetic affections, deemed trivial, should be watched with care. The headach frequently occurring from disordered stomach may at length become a disease of the head itself; and there is no viscus, we have reason to believe, in which disease may not arise in the same way. It teaches us a lesson of equal importance in the treatment of diseases, to make ourselves minutely acquainted with their history, in order to ascertain, if possible, whether sympathy with other parts had contributed to produce disease in the parts now most prominently affected; for if this be the case, and the affection of the former still continue, we shall attempt in vain to restore health by means directed only to the seat of the prominent disease. In this way, we have reason to believe many cases are allowed to prove fatal, for which a remedy may be found if we trace them to their source. The most remarkable instance of this kind which has occurred to me is the dyspeptic phthisis, on the treatment of which I am now to offer the remarks which a long attention to it has suggested.

Of the Treatment of Dyspeptic Phthisis.

In speaking of the treatment of this form of phthisis, I shall follow the same plan which was adopted in speaking of its symptoms, confining myself to those circumstances in which it differs from the other species of phthisis.

As it appears both from the symptoms and causes of dyspeptic phthisis, that the affection of the lungs is influenced by the state of the digestive organs, it is reasonable to suppose that the means which tend to improve their functions will here be a useful auxiliary to those usually employed in phthisis. In the dyspeptic we always perceive sooner or later some fulness and tenderness of the epigastric region. It is after these have supervened that disorder of the digestive organs is apt to affect the lungs; and it is in proportion as we relieve them, that we find the affection of the lungs relieved. This fulness and tenderness which we have found the best diagnostic of dyspeptic phthisis, appears from dissection to arise chiefly from an affection of the liver, and the degree of these symptoms is generally a pretty correct measure of its degree.

This species of phthisis may be divided into three stages, in which the prognosis and mode of treatment are different. In the first, the affection of the lungs is merely sympathetic, so that when the cause which produces it is removed, it ceases of course. This stage is distinguished by the short time which the disease has lasted, by the general mildness of the symptoms*, the fever in particular being very slight, and by there generally being no expectoration but what the cough itself seems to occasion, consisting of a colourless phlegm, and for the most part in small quantity. Sometimes what is expectorated is in masses of a tough glairy appearance, and of a blackish hue as if mixed with a small portion of carbon, which seem to have lain some time in the lungs, the expectoration of which relieves the cough, which in this case is seldom very troublesome. This last appearance of the expectorated matter generally indicates the very mildest form of the disease; it is when there is no expectoration, or when it is thin, scanty and difficult, that the disease is most apt to degenerate into the more alarming forms.

In the second stage of dyspeptic phthisis the continuance of the sympathetic affection has produced actual disease in the lungs. There are two ways in which this disease indicates itself. The most frequent is by some degree of inflammation supervening on the surface of some part of the bronchiæ or air cells, in consequence of which the expectorated matter begins to be mixed with small portions of a pus-like substance, which gradually increases as the inflammation extends, till the quantity we have seen is often astonishingly great. Sir Everard Home, in a treatise on the properties of pus, has shown how readily irritation of secreting surfaces produces it, independently of any breach of substance. Less frequently small vessels now and then give way, which prevents the inflammatory action, so that the expectorated matter presents no degree of the purulent appearance, but is occasionally mixed with blood. The symptoms now assume a more formidable character, the tendency to fever in particular is greater; but it seldom completely puts on the

* I do not here speak of active inflammation of the liver which also produces cough and dyspnœa, and whose phenomena further illustrate the sympathy of which I have had occasion to say so much.

form of hectic. In this stage there is either no breach of substance in the lungs, or the little vessels which from time to time give way, soon heal. It seems to be at this period that tubercles generally form. These going on to suppuration and ulceration, or the irritated surface of the bronchiæ and air-cells becoming ulcerated, the last stage commences, in which dyspeptic phthisis is nearly as fatal as any other form of the disease.

This stage is indicated by the aggravation of all the symptoms, particularly by the fever assuming more perfectly the form of hectic, and the expectorated matter occasionally containing both a pus-like matter and blood. It often happens however, especially where there has been no expectoration of blood at an early period, that no blood is ever expectorated. In this last stage the expectorated matter occasionally assumes all the various appearances observed in the last stage of other cases of phthisis.

In the first of the above stages the disease generally yields readily, except the dyspeptic symptoms are peculiarly obstinate, (in which case some degree of them has generally been of long standing, or the patient has suffered from former attacks of the disease), or there is such a tendency to a tubercular state of the lungs, that the hepatic affection which I have had occasion to observe always shows itself before dyspepsia produces phthisis, and this state of the lungs occurs almost at the same time. Such appear to me to be the chief circumstances which sometimes render the disease fatal even when properly treated at this early period; but so generally successful is a proper treatment at this period, that it required many years' observation to convince me that it will not always succeed, and to satisfy my mind respecting the causes of its failure. The last of the causes just mentioned I am convinced is the most frequent of them. It is evident that when the tendency to tubercles of the lungs is so great, the case is pretty much of the same nature with that form of phthisis which originates in the lungs, whose fatal tendency no mode of treatment, however early adopted, will always prevent.

It always adds much to the unfavourable prognosis to find that the patient has scrophulous enlargement of the more external glands, which is often such as cannot be seen, but only felt.

It will be generally admitted, I believe, that external glandular swellings and suppurations often tend to prevent internal disease. We see in the same family, some fall a sacrifice to phthisis, while others, labouring under these swellings, escape it. I have seen a person in the last stage of phthisis saved by the glands of the neck suddenly swelling and suppurating. But that slight enlargement of the external glands which may be rather felt than seen, while it indicates, is not of sufficient importance to obviate the tendency to internal disease.

Provided there is no great tendency to tubercles, and the hepatic affection is not unusually obstinate, the first stage of hepatic phthisis generally yields to the usual means of relieving the cough and tendency to fever, combined with such an attention to diet as prevents the stomach being oppressed, keeping up a freer action of the bowels than is necessary in health, and taking care by occasional doses of blue pill or calomel, according as the bowels are more or less easily acted on, to preserve a sufficiently copious and healthy secretion of bile. I have generally given the mercurial, for the most part one grain of calomel combined with the compound extract of colocynth, every second or third night, desiring the patient not to go out the next day, till it shall have passed off, and if it does not pass off in a couple of hours after rising, to assist it by a moderate dose of Epsom salts. In addition to these means stomachic medicines were generally used, particularly when the appetite was much impaired.

All of this class of medicines which possess any heating quality have appeared objectionable. Even gentian, so useful in the cases mentioned by Mr. Abernethy, seems often to increase the cough and the tenderness of the epigastrium. I have found extract of camomile flowers, combined with small quantities of the powder or oil of carraway among the best stomachics in such cases; and unless the strength be much reduced, Epsom salts have appeared to be the best assistant to the cathartic effects of the mercurial. The latter I have given, not for the purpose of moving the bowels, but improving the state of the bile, and therefore only in very small doses. I have seldom seen much advantage arise from giving more than one

grain of calomel. There is the strongest objection in all diseases tending to phthisis to debilitating doses of any medicine.

The second stage of dyspeptic phthisis requires a plan of treatment essentially different from the foregoing. When the disease has been neglected till this stage commences, which is very frequently the case, or we find, that notwithstanding the employment of the above means, the sputa begin to assume a purulent appearance, or to be mixed with blood, the tenderness of the epigastrium continuing, and an unhealthy secretion of bile constantly recurring, we may be assured that the foregoing means will be ineffectual; and that if time be lost with them till the third stage supervenes, life will be sacrificed.

The following is the plan which, under such circumstances, I have for the last nine or ten years adopted, and the efficacy of which has induced me to offer these observations to the attention of the public. Either laying aside or continuing the occasional grain of calomel as the state of the bowels seems to require, I have given one grain of the blue pill combined with some mild stomachic, two or three times in the course of twenty-four hours, continuing it either till the tenderness of the epigastric region yielded, and a proper secretion of bile was restored, or the gums appeared a little redder and fuller than natural.

As the tenderness of the epigastrium abates, and the fæces assume the natural appearance, in by far the majority of cases the pulmonary symptoms gradually disappear. It has been said by many who have seen my practice, that little is to be expected from such minute doses; but I have found the gradual effect produced by such doses on the whole much more beneficial, than the more sudden effects resulting from larger ones, which often induce a degree of debility that more than compensates for the advantage obtained from them. There are no other circumstances perhaps, under which mercury is given, where it is of so much consequence to support the strength. The evident advantage of this in all cases of phthisis is such, as to have induced some to adopt the tonic plan in defiance of every counterindication; by which I have often, particularly in this species of phthisis, which bears tonics worse than that which originates in the lungs, seen those who, there was reason to believe,

might have recovered, lost; and those whose illness might have been long protracted, suddenly destroyed.

With the foregoing, I have always combined local means for the purpose of relieving the tenderness of the epigastrium. If it be not considerable, a succession of small blisters applied over the part is sufficient. If it be so, the blisters should be preceded by the loss of from two to four ounces of blood from the part, from which practice, if the pulse be hard, although the tenderness be not considerable, great advantage often arises. When the disease is obstinate or has repeatedly recurred, a permanent discharge from this part, especially that by a seton, is often highly beneficial.

By such local measures the quantity of mercury required is much lessened. If the tenderness be very great indeed, no quantity will succeed without such means as more directly reduce the inflammatory action.

For the purpose of lessening the quantity of mercury, I have also combined with it such other means as tend to promote a regular and healthy secretion of bile. From this tendency of small doses of Epsom salts, they are preferable to other cathartics, provided they are equally suitable in other respects; but of all the means which I have employed with this view, I have found none equal to the dandelion. It ought always perhaps to be given in some form or other in dyspeptic phthisis. But it unfortunately tends to oppress the stomach, and can often on this account be given only in small doses, in which it is of little use. It is always proper to combine it with such bitters and aromatics as suit the case. When the stomach bears it well, so that the patient can take a decoction of it poured upon camomile flowers for his common drink, or what I have found better, two or three table-spoonsful of the fresh expressed juice in camomile tea, three times a day, its beneficial effects are frequently very striking. Advantage often arises from infusing a few cloves with the camomile flowers. When the dandelion can be given in the above ways, I often give only half a grain of the blue pill three times a day, and I think generally find as much advantage from it as from a whole grain without the dandelion. Many, I know, will regard the exhibition of such minute doses of mercury as little better than trifling; if however they make

a patient trial of them they will, I am persuaded, alter their opinion.

All purgatives seem to have more or less the effect of promoting a due flow of bile as well as of the other secretions poured into the bowels, and to this I would chiefly ascribe the great advantage derived from them in so many diseases, respecting which we have received so much practical information from Dr. Hamilton's invaluable work on purgatives.

If neither the tenderness of the epigastrium be removed, nor the gums a little affected by the above plan in about a fortnight, I have gradually increased the quantity of the blue pill till one of these effects took place. If either takes place without relieving the pulmonary symptoms, the prognosis is bad. If the tenderness of the epigastrium continue, the hepatic affection is unusually obstinate; if this be wholly removed without materially relieving the pulmonary symptoms, we have reason to believe that the disease has made great progress in the lungs. It is surprising from what states the lungs will sometimes recover when relieved from the irritation of the hepatic affection. I have seen many recover, not only whose friends, but whose physicians had lost hope of them. But in these cases the proper means had not been tried; if these have failed, the hope is no better than in other species of phthisis.

Where the failure of relief proceeds from the obstinacy of the hepatic affection, some hope arises from a fuller mercurial course, but this hope is often fallacious; for although such an alterative plan as I have recommended may be pursued without any diminution of strength, and is generally, by relieving the disease, attended with an improvement of it; a course that greatly affects the mouth, although powerful in relieving the hepatic affection, produces a most unfavourable impression on the pulmonary system by the debility it occasions. In such a case, however, it must with caution be tried, the only alternative being a certainly fatal termination.

I may here observe, nothing indeed is more evident, than that the quantity of mercury applied to the bowels, or to the skin, is a most fallacious measure of the quantity which the patient actually receives. To the skin in particular, in this disease, from the languid state of its absorbents, a great deal may

be applied and hardly any received by the system. I have often seen the patient much exhausted by the rubbing, and yet, as appeared from the state of the mouth, receiving very little of the medicine. Sometimes, when the patient bears it well, the exercise of rubbing seems beneficial; so little mercury is often received by the skin in phthisis, that I have sometimes thought this the only advantage the patient derived from the rubbing. In other cases it enters more readily. But independently of this objection, I have found the application of mercury to the skin much less beneficial than to the stomach and bowels in this disease, no doubt from its local effect on these organs and the biliary system being less perfect; so that I have of late seldom prescribed it by the skin, except when its internal use irritated the bowels, an effect which is generally prevented by the mild anodynes that are otherwise proper in almost all forms of phthisis. It is not uncommon in this disease to find the whole absorbent system so languid, that little mercury is received, even when it is given internally. It is almost needless to add, that its good, as well as its bad effects, if we except mere irritation of the bowels, depend on the quantity which the system receives.

It sometimes happens that the tenderness of the epigastrium is wholly, but the pulmonary symptoms only partially relieved by the above plan. In this case the hepatic affection is apt to recur, always bringing with it an increase of the pulmonary symptoms, till the structure of the lungs is at length destroyed. Here, if the recurrence of the hepatic affection be neglected, the fatal termination is rapid. If it be carefully watched and relieved as it appears, the case is protracted, and the decline of the patient gradual. I have known cases where the progress of the disease had by such means been so retarded, that there was little increase in it in the space of several months, prove rapidly fatal on the adoption of another plan, in consequence of the patient's coming under the care of medical men who were not aware of the history of the case. In such cases I have already had occasion to observe, the neglected hepatic affection, towards the fatal termination, sometimes produces dropsy of the belly. Under any plan of treatment these cases generally prove fatal at last; and the only chance of success is afforded by constantly watching and removing the first recurrence of

hepatic affection. It is necessary to have been in the habit of watching for it, to be able to distinguish such degrees of it as are often capable of greatly injuring lungs already diseased. Although the tenderness be very uniformly in the epigastrium, sometimes, though rarely, its chief seat is in the right side.

But the most fatal case is when the hepatic affection finally disappears, the seat of the disease being wholly transferred to the lungs, as happens frequently in the last stage of this species of phthisis. In this case there is no hope; while the hepatic affection continues to recur, there is always some hope, however small, that on its final removal, the lungs may recover themselves.

With respect to the parts of the treatment which are common to dyspeptic and other forms of phthisis, I have little to offer as peculiar to the former. I think I have found a combination of the extracts of white poppy and conium, the best anodyne in this form of the disease. Opium is more inclined to constipate the bowels and retard the due flow of bile, and the anodyne power of the hyoscyamus in such doses as are safe, is not to be depended on. When the epigastrium is very tender, animal food and fermented liquors are peculiarly injurious. Of cathartics I have already spoken.

Some suppose that mercury is often useful in other forms of phthisis. I have never found it so; but I think, when I have been obliged to employ it on account of other diseases being complicated with them, always hurtful. I have remarked that in these forms of the disease it never seems to improve the strength, as it generally does in dyspeptic phthisis, by improving the digestion. In them the digestion is generally good, and we have nothing to compensate for the debilitating effects of the mercury.

If there be any case of idiopathic phthisis in which mercury is proper, it is one which I have already had occasion to mention, in which the pulmonary disease produces disease of the digestive organs, of which we still find hepatic affection the prominent feature, and which always tends to aggravate the original disease. I have not however found it useful in such cases, which I think may be easily explained. In them the pulmonary affection is far advanced before the affection of the

digestive organs appears, and both on this account and because the former is the original disease, it cannot be removed by removing the latter. Besides, it is not likely that small doses of mercury will ever remove the hepatic disease, while the cause which produced it still continues to operate; and large doses, if they are capable of removing it, are here out of the question.

An alterative plan, conducted in the way above pointed out, I have found equally serviceable in what are called nervous diseases, when they arise, as frequently happens, from the above state of the digestive organs. Thus habitual depression of spirits, headache, palpitation and many other complaints of the same description may be relieved.

Worcester, June 18, 1816.

Extract from a Paper, by SIR WILLIAM ADAMS, *on the Restoration of Vision, when injured or destroyed, in consequence of the Cornea having assumed a Conical Form.*

[From the London Medical and Physical Journal for March, 1817.]

AMONG the causes producing short sight, is a morbid thickening of the transparent cornea, which has been usually termed Conical Cornea. One of the first, and, I may add, the best descriptions yet given of it, has been by Doctor Léveillé, an eminent French physician, and translator of Professor Scarpa's work on Diseases of the Eye, into the French language.

The conical cornea, although a disease not so frequently met with as many other morbid affections of the eye, is yet by no means of rare occurrence; and any curative effort which is capable of being successfully exerted, becomes the more interesting, the advanced stage of the disease (as far as I have been able to learn) having been hitherto considered by authors as incurable.

It is, therefore, highly gratifying, that the resources of art are found competent to afford effectual relief even in this apparently hopeless case, in which, although it is impossible to remove the disease itself, when thus fully formed, yet, by

taking away one of the healthy parts of the eye, whose use is similar to that of the diseased growth of the cornea (which does not admit of removal), vision, it will be shown, may be restored nearly to perfection.

The malady in question commences by a morbid growth of the whole substance of the cornea, but more particularly its central part, situated opposite to the pupil, and the patient's degree of short sight increases in exact proportion to this growth, which takes place without inflammation, and, in general, without opacity. Its advance, unless arrested by the appropriate medical treatment, is usually slow, but progressive, until, at length, the cornea, instead of being a regular segment of a sphere, wholly losing its natural curvature, assumes a conical form.

This change of structure produces some curious phenomena in the appearances as well as the uses of the cornea. On examining it in front, it assumes an unusual degree of sparkling brilliancy, nearly resembling crystal, except (as is sometimes the case) where there is an opacity in the apex of the cone. Doctor Léveillé attributes this brilliancy to the cornea's strongly reflecting, instead of transmitting, the rays of light; by which he supposes, that the pupil becoming contracted, in a strong light, thereby produces an imperfect and confused sight: but this explanation of the cause of the patient's imperfect vision, it will, however, be hereafter shown is erroneous. If the cornea be examined laterally, the thickening, it will be observed, gradually increases from its circumference to its centre, where the apex of the cone is usually seated, although, in some instances, I have seen it on one side of the centre. When the cornea is similarly examined, opposite to a strong light, its thickness at the base may, in general, be traced, while the sugar-loaf form of the apex renders it impossible to be mistaken for any other disease of the eye.

The change which this disease produces, in respect to vision, is very important. Soon after the commencement of the diseased growth, the patient complains of being unable to see objects distinctly, at the usual distance; and his power of vision becomes gradually shortened, in proportion as the disease advances, until, at length, he is unable to perceive minute objects

with any degree of distinctness, however near they may be placed to the eye; and cannot make out large ones when above three or four feet distant. In fact, vision is destroyed in relation to the useful purposes of life, and he becomes nearly as dependant as if totally blind. Indeed, I once saw a young lady labouring under this disease in both eyes, who did not venture to go any where without a guide.

The disease generally begins at the first in one eye, and a similar affection commonly succeeds in the other. I have met with it in almost every stage of life, from a girl of sixteen to an old lady of seventy, and am not aware that it is peculiar to any sex or age; although I have certainly seen it much more frequently in women than in men, and more in young than in old persons.

The opinions generally entertained of the cause of the disease in question, appear to me to have been incorrect, and have necessarily led to an erroneous practice, in the attempts which have been made for its alleviation. The conical form of the cornea has been attributed to an over-distension of that tunic, occasioned by a superabundant secretion of the aqueous humour, which, continually stretching the cornea, has gradually occasioned it to yield to the pressure from within, and thus produced the alteration in its form. To remove this supposed over-distension, it has been usually recommended to evacuate the aqueous humour, by puncturing the cornea, and afterwards to employ pressure—astringent collyria, &c. to prevent its re-accumulation. Experience has, however, shown the total inutility of these modes of practice. The operation of evacuating the aqueous humour has been, in some instances, repeated several times, without any permanent advantage being found to result from it; and, although it is an operation neither painful nor difficult to perform, yet is sometimes dangerous; for if the crystalline lens should be wounded by the instrument with which the puncture is made, cataract will most likely ensue; and I have been informed of a case, where this actually occurred, during the attempt to evacuate the aqueous humour.

Having, at an early period of my practice, been impressed with the opinion, that the conical form assumed by the cornea in this disease, was the effect of a *morbid growth* of that tunic;

and that the short sight experienced by the patient was to be attributed to its increased refractory power, and which, together with that of the crystalline lens, brought the rays of light to a point far short of the retina, it occurred to me, that, as it was impossible to remove the morbid growth of the cornea, without rendering it unfit for the transmission of light, a useful degree of vision might be restored by the removal of the crystalline lens. I was the more strongly led to form this conclusion, after having myself tried the experiment of looking through deep convex spectacles, such as are employed by patients after the removal of cataract; which, I found, produced a confusion of sight, very similar to that which I had heard described by persons in whom the cornea had been conical in the extreme degree. I, therefore, resolved, more than six years since, while surgeon to the West of England Eye Infirmary, instituted at Exeter, to remove the crystalline lens in a case in which that body had become opake, and also affected with conical cornea. Some circumstances, however, prevented the patient, who was a young woman, and a pauper, from being sent to me to the Infirmary. About three years since, another patient, from the country, an old woman, nearly seventy years of age, placed herself under my care, labouring under this disease, accompanied with cataracts; in whom I successfully removed both the cataracts, and had the gratification to find her vision thereby restored to an extent which far surpassed my most sanguine expectations. I observed that she was capable of seeing much more distinctly without convex glasses than is usual for persons who have undergone the operation for cataract, while, with a convex glass, she could read small print without any difficulty. Not being able to ascertain the degree of vision which this patient experienced previously to the removal of the cataracts, nor whether the diseased change was going on in the cornea and crystalline lens at the same time, I necessarily cannot state the exact amount of the benefit which she derived from the operation. This, however, was demonstrated—that, by the removal of the crystalline lens in eyes affected with conical cornea, nearly perfect vision was restored; while, it is well known, that in cases of conical cornea, where

no cataracts exist, vision is usually as imperfect as if the latter malady formed a part of the patient's disease.

The favourable result of this operation fully confirming the opinion which induced me to perform it, I determined, at the earliest opportunity, to try the effect of removing an healthy crystalline lens, as a remedy for blindness produced by conical cornea. A favourable case presented itself the following year, in a young woman, who, during six years, found her sight gradually decreasing, and, at the expiration of that period, had become so blind, from this disease, as to be unable to continue her employment as a servant, and was, in consequence, obliged to apply for parochial maintenance. Shortly afterwards she was sent to an Eye Infirmary in London, where receiving no benefit, she was subsequently brought to me, and solicited, in the most urgent terms, the trial of any practice which afforded a prospect of restoring her to sight. I carefully examined her eyes, and found that the cornea of both eyes had assumed the conical form in a great degree, attended by a slight opacity in the apex of each cone, but none whatever in the crystalline lens. She could walk without a guide, and could see at three or four feet distance, so as to avoid running against any person, but had entirely lost the power of reading, or perceiving minute objects, however nearly they were placed to the eyes.

I effected the removal of the crystalline lens, by causing it to be absorbed, which method of operating is to be preferred to every other hitherto practised, whether the lens be opake or not, in cases where, like the present, it admits of being freely divided. The patient, however, returned to the country before the eye had entirely recovered from the operation; and I did not see her again until nearly twelve months afterwards, when I was in the highest degree gratified to find her capable of discovering minute objects, and reading the smallest sized print, without the assistance of a glass, while holding the book at the usual distance of ten or twelve inches from the eye, nearly as well as she ever recollects to have done. The usual cataract spectacles for near objects, of two inches and a half focus, confused her sight nearly in the same manner as before the crystalline lens was removed, while with those of nine or ten inch foci, her capability of seeing minute objects was somewhat

improved. She saw objects at a distance better without than with any glass I could find: whereas the usual standard for distant vision, after the operation for cataract, is four inches focus. She now neither uses a glass for near nor distant objects, has again returned to service, and a gentleman told me, who has recently seen her, that she accurately described to him an object which was considerably more than a quarter of a mile distant. Twelve months after undergoing this operation, I operated upon the other eye; but she again left town before the eye had recovered itself, and before the lens was entirely absorbed. Previously, however, to her departure, she could read small print with this eye, by the assistance of a convex glass of two and three quarters inches focus, while with one of nine inches focus the sight was greatly improved in viewing distant objects.

In returning to the consideration of the case detailed of the young woman with the conical cornea, it may, perhaps, be supposed, that by admitting the susceptibility of the retina to have been increased by its being twelve months exercised after the operation, and the adjusting powers of the eye to have been acquired from the same cause, I abandoned my opinion, that the morbid degree of refraction of the light in its passage through the thickened cornea, together with the natural refraction produced by the crystalline lens, were the cause of the confused and imperfect vision previously experienced by the patient; this, however, is not the case, as the fact of the girl being capable of seeing after the removal of the lens, which was not in the slightest degree opake, after having been blind previously, shows clearly that the refractive powers (the conical cornea and crystalline) were too powerful, and that the cure was effected by the removal of one of them. But what I conceive proves the accuracy of these inductions is, that in the earlier stages of the disease, when the thickening has not attained the height it had reached in the case alluded to, the greatest assistance is afforded to the patient's vision by the employment of concave glasses. It is not, however, my intention to urge, that the refractive power is equally great in the thickened cornea as in the crystalline lens; on the contrary, I think that a convex glass of a less magnifying power than that usually

required after the removal of cataract, may be frequently employed to great advantage in cases of conical cornea. Were any further arguments necessary than those adduced to prove that the short sight of the patient is occasioned by the morbid thickness of the cornea, and not by the superabundant quantity of the aqueous humour, as has been supposed, it would be the well known fact that water possesses little comparative refractive power, while, from the dense structure and the form of the conical cornea, it is as evident that its powers of refraction must be very considerably increased. Indeed, gutta serena would certainly be produced by the backward pressure of a superabundant quantity of aqueous humour against the vitreous humour and retina, long before it would occasion a protrusion of so dense and firm a tunic as the transparent cornea; and I have actually seen gutta serena result from this cause without any material convexity of the cornea being perceptible, although, from over distention, it felt to the touch nearly as hard as an egg-shell.

Although I may have failed in convincing my readers of the accuracy of some of the opinions which I have ventured to submit in this paper, yet I have the gratification of knowing that I have fully proved the important fact, of having successfully carried into effect a mode of treatment capable of restoring vision in a case incurable by other means, and which, as far as I have been able to ascertain, has hitherto never been employed by any other person.

Observations and Cases relating to the Operation for Artificial Pupil; in a letter from Mr. Maunoir *of* Geneva, *to* Professor Scarpa *of* Pavia, *with the Professor's answer.*

[From the Medico-Chirurgical Transactions, Vol. VII.]

Letter from Mr. Maunoir, to Professor Scarpa.

Sir,

I have delayed to convey to you the assurance of my gratitude for that confidence in my skill with which you have inspired the Marquis of Beaumanoir, until I should have some

interesting information to give you relative to his case, and more especially until I should have in some degree justified your favourable opinion of me. I have been indebted to you for one of the greatest enjoyments which can be experienced; that of creating, as it were, the faculty of sight, in a person whom time had not yet accustomed to the privation of a sense so precious, and who at the same time had lost nearly every hope of ever recovering it. I am indebted to you also for other, and still greater obligations. The charm of your letters, the friendship and esteem with which you honour me, and the excellence of your instructions have been to me the most powerful stimulants. You make me love my profession with greater ardour, and excite in my mind the liveliest desire of extending its limits. I transcribe to you in the words of the Marquis himself, the following account of the origin of his misfortune; the most trifling circumstances relative to this case cannot but be highly interesting.

"In the severe winter of 1784, I was first attacked by an inflammation in both my eyes, which prevented me from performing my military duty: for five weeks I had recourse to the following remedies: blisters on the nape of the neck, foot baths, whites of eggs applied to the eyes, &c. In November, 1796, my sight was affected by a second inflammation. I had been wounded about this time, and was copiously blooded to remove a difficulty of speech caused by the effects of the wound, which was received in the stomach, grazing the left ribs. Finding myself in the course of the winter affected with an incessant stammering, the bleedings were repeated, during all which time there was a constant inflammation of the eyes. In the month of May they were restored to their natural state, and I recovered the entire use of my speech; but could neither give myself up to my professional service, nor to any thing which demanded fixed and serious attention.

"During a journey in Russia towards the end of the same year, I suffered from several slighter attacks of inflammation, which subsided without the application of any remedies. Having been obliged to pass the winter of 1798 in Siberia, the brightness of the snow, the rigour of the climate, the violence of the whirlwinds, to which I was frequently exposed, the

ardent reflection of the sun upon the snow and ice, the penetrating smoke which fills the greatest part of the habitations of this dreary country, all these causes contributed to keep my eyes, which were already weak and delicate, in a continual state of inflammation.

"In 1800, I could neither write nor read. A little while after, I was still able to perceive the light, but less with the left eye than with the right. In the month of August of the same year, during my residence at Vienna, I consulted several eminent oculists, and among others Mr. Beer, who was of opinion that my sight could be restored only by an operation on the left eye, which he performed himself, but without success. Since that period I have entirely lost the use of that eye; and the inflammation which resulted from the operation, did not subside, notwithstanding the application of every remedy, before the month of May in the following year.

"In 1806, I suffered again from another inflammation which lasted three weeks, after which time I entirely lost the power of conducting myself.

"In 1810, having become totally blind, I placed myself under the direction of Dr. Frederick at Vienna, and in the month of September of the same year, recovered the use of the right eye sufficiently to conduct myself alone. This advantage was but of short duration; intervals of more or less repose, and of severe inflammation, succeeded each other, until the year 1812, when I again totally lost my sight, preserving only the power of distinguishing, with my right eye, light from darkness.

"In 1813, I resigned myself entirely to the will of Providence, my medical advisers having declared that they could do nothing more for me. However, being at Pavia in the year 1814, I consulted the famous Scarpa, who recommended me to place myself under the direction of Professor Maunoir of Geneva."

The state of his eyes when I saw them for the first time at the beginning of April, 1815, was as follows.

They were large, prominent, the upper eyelid rather red than white, and slightly swelled; the conjunctiva covered with vessels a little too full; the iris of a bluish grey colour, and pre-

senting, instead of the pupil in the centre, a white spot of the size of a small pin's head. This spot which could only be the corresponding portion of the capsule of the crystalline, seemed to be adherent to the iris in both the eyes, and was of a whitish grey colour in the left eye, and milk-white in the right. It was impossible to decide *a priori* whether the crystalline was transparent or opake, since it was entirely hidden by the iris, and by a small portion of the capsule. The Marquis preserved the faculty of distinguishing very clearly the transition from darkness to light; but this power was much weaker in the left eye than in the right.

Saturday, 12th of August, 1815, I operated on the right eye in the following manner.

The patient being seated on a chair and having the head inclined upon a cushion, I placed myself behind him, and with the forefinger of the left hand confining the upper eyelid, whilst an assistant depressed the lower, I made with the right hand a semicircular incision in the lower and external part of the cornea. This incision occupied a full third of the circumference of the membrane. A quick movement of the eye during the operation obliged me to bring the edge of the instrument so low as to cut slightly the conjunctiva, which occasioned a slight hæmorrhage; but the application of a sponge dipped in cold water, and a moment's repose, remedied this little accident. On reopening the eye, the iris was seen projecting a little from the wound in the cornea. I replaced it with the blunt point of my scissors. Introducing the two blades closed into the anterior chamber, and then opening them, I caused the pointed blade to penetrate the iris, leaving the blunt blade between that membrane and the cornea; then closing the scissors, a perpendicular incision of the iris resulted, describing a little more than half the cord of an arc of two-fifths of the circumference of the iris, traced on the side of the temple. This first incision not having occasioned the formation of a pupil of the necessary size, I introduced the scissors into the iris a second time a little obliquely; and immediately the pupil appeared of a satisfactory form and size, but exhibiting the crystalline entirely opake.

The second stroke of the scissors had divided the capsula:

I therefore introduced a small curette, in order to endeavour to destroy what adhered of the crystalline to the shrunk and contracted circumference of the old pupil. It will be seen presently that this attempt did not succeed. Lastly I effected the passage of a portion of the opake lens by means of a slight pressure with a large scoop exercised on the lower part of the globe of the eye. The crystalline, which was of a cheesy consistence, came out with the greatest ease, and though it was not entirely removed, yet a sufficient quantity was discharged to leave the artificial pupil of a most perfect black. This new pupil was on the side of the temple, and at the exterior and lower part of the iris. The old pupil, which had neither changed in form or size, and remained always closed by a white opake body, was not comprised within the area of the new pupil, but was situated internally, and above it. The new pupil had the form of an irregular trapezium. The Marquis received immediately some confused idea of objects in the light.

The eye was reopened the fifth day after the operation. The wound in the cornea was well healed, and the conjunctiva scarcely red. The patient had suffered no pain, but when the eye was exposed to the light, he saw nothing; the new pupil which had preserved its form and size was obstructed by that portion of the crystalline which I had not been able to extract, and which was extremely swelled. I hoped however that this fragment of the crystalline would sooner or later be absorbed either entirely, or in part, and that the new pupil would in the end become black; but I was much afraid of the formation of a gutta serena. During the first three weeks after the operation, the Marquis of Beaumanoir distinguished no one object, and his despair as well as my anxiety continued daily increasing.

Notwithstanding, I saw the lower edge of the crystalline gradually disappear, and the pupil in the corresponding part become black, and yet in spite of this favourable change, the sight did not return. All at once, early in the month of September, he distinguished first his hand, then his fingers, then the houses in the street. Since this fortunate moment his sight has gradually acquired strength in proportion as the crystalline was absorbed.

At present, December 1, he can read written characters of the size of a fourth of an inch; he distinguishes the hour by the clock; he perceives at the same time the two hands of his watch; he conducts himself with ease in the street or in the road; he avoids obstacles, distinguishing men, women, children, and animals; he does not confound a willow with a poplar, or a poplar with an oak. He evidently gains something every day, and makes a sufficiently apparent progress.

The Marquis wished earnestly that I should operate on the left eye. I did it with repugnance, and not till I had warned him that I expected from it little or no advantage. September 11, I made an incision in the cornea of this eye, in the same manner as I had before done in that of the right; and at the very instant the iris came out of the wound, swelled and enlarged by the crystalline which was spontaneously displaced, so that the lens was in fact without the eye, forming a hernia of which the iris was the bag, veiling it closely, and enveloping it on every side. I gave a stroke of the scissors to the tumour, and the crystalline came out with the greatest ease, to all appearance whole, but extremely small. The iris did not re-enter spontaneously, but it was easy to restore it to its place. The pupil then appearing very small, I gave it a second stroke with the scissors, when the pupil, which was of an irregular form, appeared of sufficient size and of a perfect black.

When I examined the eye on the fifth day after the operation, I found the pupil partly obstructed by the opake capsula, and partly contracted, but still sufficiently visible in the exterior and lower part of the iris, with a small round opening of a perfect black: it appears more than probable, that if the retina had not been previously enfeebled by a violent disorder resulting from the first operation, the Marquis would have recovered the sight of his eye to a certain degree, without any difficulty. But the new pupil has remained during nearly a month, like that of an eye diseased with an amaurosis. It is within a very few days only that this eye can be said to have gained something, and the Marquis can now distinguish the moon, a lighted candle, the fire, or any bright objects which pass before him. The only forms which he has yet been able to ascertain with precision, are the square frames of his windows.

I will not attempt to give you any idea of the form of the crystalline, which remains in the right eye, because it undergoes some change every week, and because it is probable that these changes will last until its entire absorption. I might assist this operation, in making a fresh incision with a needle upon the remainder of the crystalline, but I am unwilling to cause the slightest irritation to the eye, as long as the unassisted force of nature appears to act in an advantageous manner. It will not be till the natural force appears to be languid, or rather entirely inefficacious, that I shall expose by means of an incision a new crystalline surface to the action of the aqueous humour. With respect to the iris of the left eye, there is no crystalline to dissolve, and in consequence I propose to give it shortly a sufficient extent.

I proceed to lay before you some account of two other operations for artificial pupil, of which one took place a few days before that performed on the Marquis, and the other in the course of the last month. I copy simply my notes taken at the time.

"Mr. Cherbuliez, bookseller, 46 or 48 years of age, has had since his infancy an albugo on the left eye, caused by the small-pox; it occupies a full third of the cornea on the side nearest the temple, and the rim of the pupil almost adheres to this disordered membrane, a very small portion of it is free, which makes the edge of a pupil of the size of a small grain of millet, with which Mr. Cherbuliez can only see indistinctly, with pain, and very near. The cornea of the right eye is irregularly and nearly always obscured by a species of mist which is the consequence of frequent ophthalmia. This same eye had been lately affected with amaurosia, from which it had very considerably recovered. It was but of little use to the patient. The crystalline of the left eye was evidently transparent, and it became necessary to take care of it. I operated on the third of August, 1815, in the following manner.

"The patient was seated in a chair, his head resting on the breast of an assistant, who at the same time raised the upper eye-lid. I placed myself behind him, and with the forefinger of the left hand, I depressed the lower eye-lid. I then made with the right hand a semicircular incision of about three lines in

length, and as much upon the opake part of the cornea as upon the transparent.

"I then introduced into the wound my blunt scissors, and penetrating with one of the blades through the small pupil which I have mentioned, I succeeded in making an incision without wounding the capsula or the crystalline, cutting the orbicular muscle in a transverse direction, and continuing nearly parallel between the fibres of the diverging or radiating muscle; this incision describes an entire radius of the disc of the iris. Its immediate result was a perfect triangular pupil of the most brilliant black.

"Every thing went on well during the first 50 hours, when Mr. Cherbuliez having made a violent effort in going to stool, caused a small hernia of the iris. This accident did not change the form or the size of the pupil. I have three times effected the depression of this rupture of the iris, by introducing a needle for the cataract. At present the staphyloma is little or nothing.

"Mr. Cherbuliez has resumed the ordinary course of his affairs, he writes and can read the finest written characters, nor is his eye fatigued even by a long series of occupation."

I come now to the account of the last operation which I have performed.

"A woman of the name of Saillard, 26 years of age, and mother of an infant of some months, received a thorn in her left eye, as she was cutting wood in a forest, about two years ago. She did not suffer much at the time, but the consequences of the accident were fatal to the sight of the eye. Her state when I saw her for the first time was as follows:

"The pupil, which was shrunk and irregularly fringed, and entirely incapable of any movement of contraction or dilatation, was partly covered by a spot or shell, milk-white and apparently in conjunction with the iris. Where the pupil was not covered by this body, it appeared to me at first sight black, and the woman was still able to distinguish objects confusedly with this eye. The right eye had had a cataract for nearly a year, and the pupil was immoveable and fringed, the iris appeared to have been diseased, and the watery humour had not a healthy transparence.

"Being much occupied by a press of business, and not wishing to occasion a loss of time to the patient; thinking besides that the crystalline of the left eye was transparent, and that I had nothing to do but to increase the pupil which was too small, I took with me only my scissors blunted at both points; but at the moment of the operation, and favoured by a bright day, I perceived that the crystalline was decidedly opake, though at the same time in such a manner, that I could easily have supposed it to be transparent the first time I observed it, and especially in a situation where the light was not favouable.

"It was now evident, however, that it was necessary to extract the crystalline, and that if I enlarged the pupil with my blunted scissors, it could only be by cutting the iris in the upper part of its disc, an operation which would render the extraction of the crystalline difficult, and even perhaps impossible, since it was probable that some extraneous substance would adhere to it. In consequence of these considerations, I made my decision instantly, and performed the operation in the following manner:

"I first made an incision in the lower part of the cornea; then introducing the point of my instrument into the lower part of the iris, the puncture gave me an opening of the size of a pin's head, sufficient to allow the passage of one of the blunted points of my scissors, with which I cut the narrow strip comprised between the hole caused by the knife and the natural pupil; I then obtained immediately a pupil of a good size, and which exhibited a crystalline humour of a whitish grey colour. Then observing that the compression which I exercised upon the eye appeared in no degree to move the crystalline, I passed behind it a very small scoop, and drew it out of the eye by this means, with the greatest facility. The pupil was then of a perfect black, but the white spot had changed its situation and now obstructed the lips of the wound in the cornea. After having endeavoured in vain to remove it with the scoop, I was obliged to seize it with the forceps, by which means I drew it out, together with a transparent membrane which adhered to it, and seemed to detach itself from the iris: it proved on examination to be that of the crystalline. The white body was of the size of a lentil, and entirely of a cartilaginous nature. The patient

saw immediately, and distinguished perfectly every object which I presented to the eye, but they all appeared coloured with a tinge of blue.

"Six days after the operation, I showed the woman to my society of medicine, where she was seen by Messrs. Odier, Peschier, Aubert, Colladon, De Roches and Morin. The cicatrix of the cornea was in a healthy state, the pupil of a good size and of a perfect black, the sclerotica was scarcely red, and the patient saw very small objects tolerably well. She returned to her house at Chable the next morning, seven days after the operation."

I have the honour to be, &c. &c.

J. P. MAUNOIR.

Geneva, December, 1815.

Letter from Professor Scarpa to Mr. Maunoir.

SIR,

I have received with the highest satisfaction the account with which you have favoured me of the success of your operation on the Marquis of Beaumanoir. It gives me great pleasure to have been in any degree instrumental to the service you have rendered him, and I request you to present to him my hearty congratulations.

Every lover of the science cannot but feel interested in the narration of the difficulty which attended this operation, as well as that performed on Mrs. Saillard, on account of the opake crystalline, which in both cases adhered to the lower circumference of the iris, and the edge of the closed pupil. This has given me occasion to make some reflections on the subject, which I take the liberty of communicating to you with my usual freedom.

The detail of both the operations in the above mentioned cases, exposes a certain degree of difficulty and uncertainty in the proceeding, which I should wish to see removed or corrected; and I have great hopes that you will be able to attain this desirable object.

In the first place, I am of opinion that it is not necessary to be scrupulous whether the crystalline be partly or entirely

opake, whenever the capsule is opake, and adheres to the iris behind the edge of the anterior and inclosed pupil. In this case, only one remedy can be pointed out, namely, the removal of the opake adherent capsule, and consequently of the crystalline, whether it be transparent or opake.—In the second place, I think there is no reason to doubt that, in similar cases, it is adviseable to make an incision upon the iris proportioned to the size of the body to be extracted, rather than to make it small, which obliges the operator to divide the crystalline and the capsule, with the intention of extracting a part, and of abandoning the rest to the powers of absorption.—Thirdly, I would establish as a fundamental principle in similar cases, that after the complete extraction of the crystalline with its opake capsule, by means of the least possible introduction of instruments, the artificial pupil ought not to be too near the incision in the cornea, and, consequently, not too near the cicatrix occasioned by it.

The causes of the obstacles, to which you were exposed in the two cases above mentioned, may, I think, be perceived from a consideration of the principles I have just stated. In both the incision in the iris was too small in proportion to the size of the body to be extracted; and in both, the position of the artificial pupil was very disadvantageous; that is to say, on the side of the temple and close to the incision in the cornea.

After reflecting attentively upon this situation of the artificial pupil, and upon the obstacles which it presents to the operator, it appears to me, if I am not greatly deceived, that a method of operation compounded of that of Wenzel, and of your own, would perfectly answer the desired end. Wenzel, as you are aware, made an incision upon the cornea and the iris with a single stroke of his instrument, taking care that this transverse incision should pass through or underneath the centre of the inclosed pupil. He then took off, by means of the scissors, a portion of the edge of the iris, for the double purpose of extracting with facility the opake crystalline with its capsule, and of leaving a permanent artificial pupil of sufficient size. In the method which I would suggest, after having made, in the manner of Wenzel, a transverse incision in the iris and in the

cornea, I would introduce your scissors, blunted at both points, into the anterior chamber of the aqueous humour, with which I would make an incision in the iris, diverging from the cut made by the knife, so that your usual triangular edge might be the result, having a curvilinear side. This aperture, which requires only a single stroke of the scissors, will be, I think, sufficiently large to allow easy egress to the crystalline and the capsule; and this so much the more easily, in proportion as the point of adherence of the capsule to the iris, is comprehended either entirely, or in a great measure, within the two incisions. By this means the facility of making the crystalline and the capsule pass obliquely out from the iris will be increased on account of the enlarged space that will result from the cut with the scissors diverging from that made by the knife; and I should prefer this incision with the knife to the puncture made by you in the iris of Saillard, to afford a passage to the blade of the scissors. Besides this, the direction and the situation of the triangular edge of the iris will be calculated to leave a pupil not only permanent, and sufficiently large, but also placed opposite to the cut in the cornea, and accordingly more convenient for the purposes of vision; especially if it fall upon the side of the iris nearest the nose, which ought, if possible, always to be the case.

I have thus briefly given you my opinion on this subject. You will recollect that you permitted me to make objections and suggestions. I have done so; and it now belongs to you in the course of your practice to make trial of the method I propose, and either to confirm or reject it; or, which will not be difficult to you, to suggest some new and more practicable expedient. It is certain that this complicated case of the pupil, that is to say, where the crystalline is found opake, together with the capsule adhering to the iris, requires an exertion of genius and skill, united to a more perfect method of operation, than that which has been hitherto practised. Your researches have already been so numerous and so successful in this branch of our profession, that we have a right to expect you to proceed in the completion of your work. Till within a very few years, our knowledge respecting the artificial pupil, and the

method of conducting the operation, was involved in great obscurity, and practice was sometimes even in opposition to the known anatomy of the eye. It is by solid and fixed principles alone that we ought to be guided in all that variety of complicated cases, which frequently accompany and aggravate the inclosed pupil. In estimating the extent of the services which you have already rendered to the profession, I run no risk of error in enumerating the following facts as the results of your most useful researches.

1. That no instrument is so proper as the scissors for making an incision in the iris.

2. That to do this, when there is no complication resulting from a cataract, a very small incision in the cornea is sufficient, about half the size of that which is made for the extraction of the crystalline,—a fact which on many accounts is of the highest importance.

3. That the formation of a triangular edge in the iris by means of a double incision with the scissors, is the most easy and least painful of all the methods hitherto proposed for obtaining a *permanent* artificial pupil.

4. That the spots of the cornea present no obstacle, because it is possible to produce the artificial pupil in that part of the cornea remaining transparent, in the quarter opposite to that in which the incision is made,—a fact of the greatest importance.

5. That it is possible to obtain the artificial pupil without injury to the crystalline or its capsule, whenever these parts are preserved transparent, in spite of complete confusion in the iris.

If to these advantages, which your method of operation possesses over all those hitherto practised, you are able to add that of rendering as little laborious as possible the manner of making the artificial pupil, in those cases where it is necessary to remove at the same time the crystalline and its opake capsule adherent to the lower surface of the iris, you will fulfil not only all my wishes, but those of all who are interested in the cause of humanity, and in the progress of science. The state of my health does not permit me to follow you in this useful career, and leaves me only the power of witnessing and of ap-

plauding your success. I have much pleasure in informing you that your scissors have begun to be used here, and Signor Morigi, my successor in the chair of surgery, has lately availed himself of them with great success in an operation for the artificial pupil. He is a man of considerable ability, whom you will find mentioned with deserved praise in several places of my work.

I have the honour to be your most sincere friend and humble servant,

A. SCARPA.

Pavia, Jan. 1, 1816.

SELECTED REVIEWS.

1. *An Inquiry into the Causes of the Motion of the Blood, with an Appendix, in which the Process of Respiration and its connection with the Circulation, are attempted to be elucidated.* By JAMES CARSON, M.D. Physician to the Workhouse, the Fever Hospital, and to the Asylum for the Pauper Lunatics, at Liverpool; and in charge of the Military Hospital at that place. Liverpool, 1815. 8vo. p. 250.
2. *An experimental Inquiry into the Nature, Cause, and Varieties of the Arterial Pulse, and into certain other Properties of the larger Arteries in Animals with warm Blood, illustrated by engravings.* By Caleb Hillier Parry, M.D. F. R. S. &c. &c. Bath, 1816. 8vo. p. 180.

[From the Annals of Medicine and Surgery, for June, 1816.]

NONE but Hutchinsonians would in these days deprive Harvey of the honour of having discovered the greater circulation of the blood.* They, resolved to make the Bible a complete system of natural philosophy as well as of religious doctrine, regard the 6th verse of the last chapter of the book of Ecclesiastes as satisfactory proof, that Solomon was acquainted with the circulation. We do not imagine that any of our readers, whether acquainted with Mead's exposition of the paragraph or not, are infected with so absurd a prejudice.†

Although the second centenary of this discovery will in three years arrive, strange it is to say, and much stranger would it be, if the Hutchinsonians were correct, that the means by which the circulation is accomplished, have been to the present moment all but entirely unknown. The heart, it

* The lesser, or pulmonary circulation was known to the Italian physicians.

† Mead well explains the whole metaphorical account of senile decay. The passage alluded to runs, "Or ever the silver cord be loosed, or the golden bowl be broken, or the pitcher be broken at the fountain, or the wheel broken at the cistern."

is certain, propels the blood with great force into the aorta; but how far this force operates, what assistance the arteries contribute, what the veins, what various attendant circumstances, is all uncertainty and confusion to the student, whether listening to his teachers, or studying physiological writers. We rise from Hunter little more satisfied than from Haller, and from Bichat little more satisfied than from Hunter. Curiosity, unaccompanied by hope, induced us to look into Dr. Carson's book. We were soon agreeably surprised, and although no inconsiderable effort of attention was required, we perused the whole work with the greatest satisfaction. We consider it the best physiological work upon this subject. In our last number we presented our readers with a review of many important additions to our knowledge of the functions of the nervous system, and it is gratifying to be able to present them in this number, with a review of some additions to our knowledge of those of the sanguiferous, and procured too without the torture or the murder of a single animal. "It is," says our author, "perhaps to a censurable degree, the fashion of the philosophers of the present day, to aspire after distinction by the number and variety of new experiments, rather than by weighing well the tendency and value of those which have been already made."

The work is written with great neatness and perspicuity, and although it has been censured for containing anatomical detail, we can scarcely blame it on this account; for of all our elementary knowledge, anatomy is forgotten the soonest, and most medical readers, we believe, require their memory to be refreshed while listening to physiological arguments.

It is divided into three parts. They contain,

1. An enumeration and estimate of the causes which have been supposed to promote the circulation of the blood.

2. The developement of other causes which appear to contribute to the motion of the blood; and which, added to the preceding, will, it is presumed, be found adequate to the effect.

3. An explication of phenomena.

There is likewise an appendix, containing a brief explanation of the mechanism of respiration, and of the connexion

which is supposed to subsist between it and the circulation of the blood.

We shall be pretty full in our account, as the perusal of the book itself, however gratifying and beneficial in many parts, requires stronger attention than many medical readers possess the powers or the leisure to bestow.

1. It was contended by Harvey and his followers, and the opinion still prevails, that after contraction, the right auricle is dilated by the force of the blood returning to it by the veins, and that the ventricle is dilated by the force of the blood impelled against the internal surface of its walls by the contracting auricle. The force of the blood returning to the heart, Harvey and many others supposed to be derived from the contraction of the left ventricle. But whatever may be the impetus given to the blood driven from the left ventricle, it must in the course of circulation be diminished and expended according to the common laws of motion. If the circulation is produced by the impelling powers of the ventricles alone, either each particle of blood issues into the aorta, with momentum sufficient for its progress, and its return to the right auricle with the degree of momentum which it is known to possess on its return; or, as the sanguiferous canal is full of blood, the additional quantity thrown in at one end, must force out a corresponding quantity at the other. The first supposition is inadmissible, because it is impossible for a body endowed with a certain degree of momentum, to retain it undiminished through a long course, subjected to many powerful resistances. The second supposition is inadmissible, when we consider that the quantity of blood is nearly one fifth of the weight of the body, that it is spread over an immense surface, and consequently exposed to great friction, especially in the small vessels; that the currents on account of the anastomoses are perpetually flowing in opposite directions; it is impossible for all this labour to be executed by the propelling power of the ventricles—the root of the aorta exposed to the full undiminished amount of this force, would at every pulsation have been in danger of rupture. In this case too, it would have been necessary for the whole sanguiferous system to have been in a constant state of great distention, otherwise the admission

at one extremity would not have been necessarily attended by a corresponding expulsion at the other, yet the veins are evidently but little distended, as the great swell consequent upon the application of a ligature to any of them proves: besides, any considerable loss of blood, diminishing this general tension, would have destroyed the circulation. Among minor arguments, Dr. Carson mentions the circumstance of the hearts of animals not being in proportion to the bulk of their bodies, as the sole dependence of the blood's motion upon the heart would have required. But it is to be remembered, that the size of the heart is rather in proportion to the quantity of blood to be moved, and indeed the force with which it is to be moved, and that the quantity of blood is not always in proportion to the size of the body. "The right ventricle is equal in size to the left, if not larger, which sends its blood to the lungs only, which are infinitely small when compared to the body; and the hearts of those animals which have but one ventricle, as fish, for instance, which is similar in use to our right, are perhaps made as large in proportion to the size of the body as both ventricles in the quadruped.*"

As the heart appears unable alone to maintain the circulation, let us examine whether the arteries are able to supply the deficiency.

The pulsation of arteries during the contraction of the left ventricle, was considered a proof that the dimensions of them were increased, and their elastic and muscular coats were conceived to restore their original capacity. But less force would be gained than was imagined, because as much must have been expended in dilating the elastic coat, as was gained by the effective exertion of its elasticity. Dr. C. considers nothing to be gained; but surely, granting the dilatation, which, on reviewing Dr. Parry's work, we shall find reason to doubt in the larger arteries, the muscular contraction of the arteries would add to the momentum of the blood. Weitbrecht of St. Petersburgh objected, that the small quantity emitted from the left ventricle at each pulsation, was insufficient to produce the general distention, and physiologists were under the necessity

* Hunter, on the Blood, &c. p. 141.

of supposing, that the quantity propelled into the beginning of the aorta caused it to dilate, and by a succession of dilatations and contractions, caused a rapid but successive dilatation of the whole arterial system. Granting this mode of explanation, certain reasons appear to justify the conclusions, 1. "That the *vis a tergo* or force derived from the heart and arteries, is insufficient to balance and keep in motion the whole blood in the venous system. 2. That from various phenomena accompanying this part of the circulation, the motion of the blood, as it exists in the veins, could not be produced by any power alone, however strong, that was so directed."

1. "If we take into consideration the quantity of blood in the veins, it will appear too great to be sustained and kept in motion by the contractions of the last part of the arteries alone. The veins are supposed to contain at least twice as much blood as flows in the arteries. But the weight of this mass, upon the supposition of its being balanced and advanced by an impulse from the ends of the arteries, is enormously increased by the form of the vessels in which the fluid to be moved is contained, and by the position of these vessels in relation to the moving power. The veins, as has been mentioned, ramify from trunks which arise from the heart, after the manner of the branching of a tree. The area of the transverse section of all the branches united, continually increases the further this section is taken from the heart; and at the ends of the veins, at which the impulse must be made upon the blood, the area of the transverse section is the largest of all. The blood therefore, in approaching the heart, is constantly passing into a narrower channel. Its motion is expended not only on the column of blood before it, but upon the contracting sides of the channel along which it moves. So that in fact, the impulse necessary for advancing the blood in the veins would not have the weight of the blood before it, alone, to support, but the weight of a cylinder of blood, the base of which is equal in area to the transverse section of the veins at their ends, and the height is the distance between this section and the heart. The form and position of the veins, are therefore the most unfavourable that can be conceived to the motion of the blood, upon the supposition of its being totally advanced by a *vis a tergo*." "The veins

form frequent anastomoses. By the collision of currents meeting at considerable angles, the momentum of each is to a certain degree expended."

2. "But allowing that the heart and arteries were sufficient to advance such a quantity of blood under all the impediments to which it is subjected, the veins are evidently not fitted for their supposed office. They must be allowed to be always in an extreme degree of distention. In the lower extremities, particularly in the erect posture, they would necessarily have to sustain such a degree of lateral distention as their coats could scarcely be supposed to resist. The valves, with which these vessels are furnished, admitting them to be as perfect as possible, could not remove this pressure at all times; for they must be opened by the force of the blood advancing to the heart, when the vein would have to sustain at any part the weight of a cylinder of blood, of which the base was equal to the square of the diameter of the vein at that part, and the height to its distance from the heart. But the veins, even in the lower extremities, do not appear to sustain any considerable degree of lateral pressure. When slightly pressed, they swell on the side of the point of pressure farthest from the heart, to a considerable size. They certainly therefore, in their ordinary state, are not in the situation of rigid tubes; which they must be admitted to be, upon the supposition of the blood being advanced through them by a force impressed upon this fluid at their distant terminations. Besides, a vein wounded in these circumstances, would never cease to flow while there was any blood in the part of it between the orifice and the heart, which would be nearly as long as there was blood in the system."

There is no proof of any propelling powers in the larger veins, whatever may be supposed in the smaller, in common with all the capillaries. That voluntary muscular motion is not necessary to the blood's motion through the veins, is shown by the continuance of the circulation during rest; and the pressure of the dilated arteries upon the veins, spoken of by many writers, and even by Mr. Hunter, must be first proved to occur, and secondly to possess the power which is ascribed to it. Indeed an increased velocity in the motion of the venous

blood, from compression, whether by muscles or arteries, is very problematical. The muscular contraction which drove the blood flowing between the centre of pressure and the heart, with augmented impetuosity, would close the valves against the blood that was coming from the extremities, and bring for a time to rest the whole current that was in motion, between the shut valves and the ends of the veins; and as the space into which the venous blood flows is gradually becoming smaller, arterial compression would rather drive the blood backwards into the greater space, than onwards where the resistance is stronger. The acceleration of the pulse by exercise, must be otherwise accounted for. Dr. Wilson (*Inquiry into the powers employed in the circulation of the Blood*) suggested, that during the relaxation of the heart, the blood would be sucked up by it from the *venæ cavæ*, and the circulation thus importantly promoted: and although Dr. Wilson did not substantiate his opinion, we shall find it to be true, and in fact to be the ground-work of all Dr. Carson's doctrine.

2. We come now to the peculiar doctrines of the author. The chief, in short, amounts to this,—that the lungs being very elastic, prevent the effect of the atmospheric pressure to a great degree upon the heart, while the blood of the veins, being in common with all other parts of the body, exposed to the full force of this pressure, is thereby driven into the auricle the moment its contraction ceases, thus constituting an antagonist power to the muscular contracting power.

The substance of the lungs is known to be eminently elastic. By bending and plunging the trachea of slaughtered animals into water, and then puncturing each side of the chest, a quantity of air was expelled from the lungs, capable of supporting a column of water several inches in height. This shows the lungs to be in a constant state of forced expansion, otherwise the pressure of the air admitted into the cavities of the chest would not produce collapse. How great their elasticity is, we do not know, because the force with which they acted upon the last portion of air within them, in Dr. Carson's experiments, was of course much less than it would be when they were fully dilated, as the resistance given by elastic bodies to a stretching or dilating cause, increases with every addition

to that cause. The lungs, therefore, afford great resistance to the atmospheric pressure. The heart must constantly experience this diminution of pressure, and when its fibres relax, the blood must of necessity rush into it, viz. where there is least resistance, and will be thus drawn from the *venæ cavæ* into the right auricle.

"By removing, therefore, in consequence of their elasticity, a part of the pressure of the atmosphere from the convex surface of the heart, and by that means causing the ordinary pressure to ponderate unequally against the concave surfaces of the chambers, the lungs become the certain and powerful antagonists of the muscles of the heart. The contractile force of the heart is necessarily more powerful than the antagonist action derived from the elasticity of the lungs, but the former is transient and interrupted, while the latter is equal and permanent; during the intervals between the exertion of the muscular energy, it becomes predominant; and co-operating with the natural tendency of the structure, restores the chambers of the heart to the state from which they had been forced, and at which the superior strength of the contractile power begins again to be exerted."

The circulating powers are thus described in a recapitulation which closes the second part.

"By every contraction of the ventricles, a quantity of blood is projected forcibly into the great arteries. As the coats of the arteries are dilatable, these vessels give way to the impetuosity of the propelled blood; and, to a certain distance from the heart, become of a more enlarged calibre. In consequence of the stimuli derived from the blood newly admitted into the arterial cavity, and (if so bold a metaphor may be used) from the pain of distention, the irritability of the muscular fibres is excited, and co-operating with the elastic, restores the artery by a rapid movement to its former dimensions. As the blood is an incompressible fluid, a quantity, equal to that projected from the heart, must now be displaced from that portion of the arterial system, which had been dilated by the immediate impulse of the ventricles. The valves, which are stationed at the roots of the great arteries, and which are securely closed, during the contraction of the first portion of

the arterial system, by the retrograde movement of the blood nearest the heart, and more effectually by the suction occasioned by the synchronous dilatation of the ventricles, completely prevent the return of any fluid from the arteries into the heart; while the more ample calibre possessed by the aggregate of the vessels beyond the contracting portion, and the distensible condition of their relaxed fibres at the moment, favour its advance into a more distant portion. This portion, now distended and stimulated by the same causes by which the first had been excited, recoils vividly upon its contents; and, by the rapid resumption of its former capacity, expels from its cavity a quantity of blood equal to the addition which it had received during its dilatation. The blood, displaced by this movement, from what may be termed the second portion of the arterial system, is directed into a more advanced part of it, by the different state of the coats of the vessels, and the difference between the agregate of their calibre before and behind the contracting portion; because, in consequence of the rapidity of the vibratory undulation, the coats of the vessels between the contracting portion and the heart are still rigid, while those beyond it are relaxed and easily dilatable; and because the outlets on this side are greater as the aggregate of the bores of the vessels increases with the distances from the heart. The same series of actions is repeated to the ends of the arterial system. A quantity of blood, therefore, equal to that which had been projected from the heart into the arteries, is propelled from the ends of the arteries into the veins in equal times. The power of the heart may be thus said to be transmitted undiminished to the end of the arterial system.—No data were discoverable from which the momentum of the blood discharged from the ends of the arteries, or the quantity of motion it would generate in the venous blood, could be estimated. But from the mass of fluid that was to be put in motion; from the velocity with which it was known to flow; from the form and position of the vessels containing it; from the resistances opposed by friction, tenacity, and various other causes; and from the phenomena attending the venous circulation, it was concluded with the fullest confidence, that the blood could not be circulated through the veins by the impulse it received

from the arteries alone.—In searching for the causes by which the chambers of the heart were dilated after contraction, it was ascertained, that this condition of the organ was in part to be ascribed to the form and position of its fibres, in consequence of which, simple relaxation was accompanied by a certain degree of dilatation, but particularly to the supporting of a part of the atmospherical pressure that would have rested upon the convex surfaces of the heart or its envelope, by the resilient or collapsing effort of the lungs. It was urged, that the abstraction of a part of the ordinary pressure of the atmosphere from the convex or external surface of the heart, or from the convex surface of the pericardium, was perpetual, and was therefore always ready to co-operate with the dilating faculty of the heart itself, as that was alternately renewed: and that the conjunction of these powers was fitted during the intervals of contraction to dilate the chambers, to the utmost extent, or at least to the effect of the capacity of the pericardium.—In consequence of the dilatation of the ventricles by the causes which have just been stated, the valves at the roots of the arterial trunks, yielding to the greater pressure from without, become securely closed, and the resumption of blood by the heart from the arteries, is completely prevented; but the passage of blood from the auricular into the ventricular cavities is not obstructed; the blood, therefore, by which the former chambers were dilated, pursues the less resisted course and occupies the space left by the dilating ventricles. Any deficiency in the full dilatation of the ventricles, which in the healthy condition of these parts can scarcely occur, will readily be supplied by the projectile force of the contracting auricles. By the dilatation of the auricles, the valves, in the auricular passages, sustaining less resistance on their internal surface, become securely closed; but at the other openings, those by which they communicate with the venous trunks, is relieved from a part of the ordinary pressure in the direction of the heart; it necessarily takes the course in which it meets with the least resistance, and continues to move in that course until the resistance is equalized by the full dilatation of the auricles.—The heart, therefore, acts at once in a two-fold capacity. By the contraction of the ventricles it propels the blood through the arteries,

and by the dilatation of the auricle it pumps it from the veins. It is at the same time a forcing and a suction pump.

"The structure of the veins is not fitted for raising blood through them to the heart, from parts at a distance from that organ, by suction alone. For these vessels being very thin and pliant, would immediately collapse and become impervious under such influence: other agents are required to preserve the permeability of the venous vessels, to give them as it were the property of rigid tubes, and to bring the blood which they contain generally within the sphere of the action of the heart. For this purpose two causes are supposed to operate. The first, to which allusion has already been made in this recapitulation, is derived from the projectile power of the ventricles, transmitted by the vibration of the arteries to the ends of the veins. This is the *vis a tergo*, so famous in the schools of medicine. We were unable to estimate the share of the venous circulation that is to be attributed to this cause; which, however, so far as it extends, is evidently well fitted to co-operate with an abstraction of resistance in front, and to preserve uninterrupted the communication between the blood in the remote parts and the heart. The other power, which was supposed to assist in preserving the distention of the venous vessels, in opposition to the suction influence of the heart, was gravity. By the anastomoses which so generally prevail among the veins, particularly among the smaller ramifications, the system of the *vena cava* may be considered as a single canal. By its retiform fabric, the communication between the blood in the different branches, by the aggregate of which any portion of this canal is formed, is preserved as ready and free as if the blood had flowed in that portion, in a single unpartitioned channel. The position of the vessel is fixed. At the moment in which the equilibrium between the contents of the vessel may be supposed to have been adjusted, a quantity of blood is abstracted from one end of it by the stroke of the heart, while a quantity is added to the other by the synchronous contraction of the ultimate portion of the arteries. The balance between the opposing columns of fluid is disturbed; to restore the equilibrium, deranged as the actions of the heart are renewed, a motion is generated in the blood by gravity, from the ends of the veins to their roots. In short, the motion

of the blood while it flows in the veins is produced by the force of the heart and arteries urging it behind; by the abstraction of a share of the atmospheric pressure from it in front, in consequence of the resiliency of the lungs interposing its influence in the intervals between the contractions of the heart, and by gravity, which is rendered available in this case by the projection of the arteries and the diastole of the auricles."

The statement of the dilatation and contraction of the larger arteries we shall afterwards examine, but we differ from Dr. Carson in regard to the diminished atmospheric pressure acting as an antagonist to the ventricles and to the auricles. While the diminished weight facilitates the passage of the blood into the ventricles, it tends equally to retain it in the cavities from which it flows into them, and renders a proportionally greater exertion of muscular contraction necessary; but as the pressure on the blood flowing from the *cavæ* into the right auricle and the pulmonary veins into the left is undiminished, there it does really act as a powerful antagonist—and there such a power is necessary, as neither *cavæ* nor pulmonary veins possess propelling muscular powers, whereas the auricles are strongly muscular, and in all appearance able to distend the relaxed ventricles with their blood. The slighter degree of suction of the ventricles in common with the auricles, from the mere relaxation of their fibres, first pointed out by Dr. Wilson, we would not deny. The effect of gravity appears overrated, for although it may equalize the blood of many veins, how can it equalize that of the iliacs, for instance, and the *cavæ* during the erect posture.

3. The suction influence of the heart upon the venous blood explains, and it alone can explain, why a punctured vein does not bleed unless a ligature is thrown upon it between the puncture and the heart. In taking its course out of the orifice, the blood would have to surmount the resistance which the whole weight of the atmosphere opposes; but in flowing along the channel of the vein, it is relieved from a share of that resistance, and it necessarily takes that less resisted passage. The same influence explains why a tied vein becomes empty between the ligature and heart. It also explains why if only one vein of the arm, for instance, be tied, it does not swell

much, and if punctured affords but little blood: the direct road for the returning blood is interrupted, but the suction influence of the heart operates indirectly by anastomosing veins, and the blood is thus drawn to the heart, although circuitously; the greater degree of swelling will depend upon the smaller number and capacity of the anastomosing branches. The absorption of blood from the cells of the penis after erection, and from the uterus after delivery, nay even the formation of new vessels in the coagulable lymph interposed between two surfaces, Dr. C. similarly accounts for.

"When a wound is made in the body, and the parts brought together and kept in that state, the plastic nature of the blood that had oozed out of the arteries drying near the surface, unites the edges of the wound. But the blood oozing out of the arteries remains liquid. The veins in the meantime have become emptied, in consequence of the blood which they contained having taken the less resisted course, and returned to the heart. The blood then which had flowed from the mouths of the arteries into the interstices between the divided surfaces, being less resisted towards the mouths of the veins than in any other direction, necessarily enters the veins and continues its course to the heart. Other blood follows, and thus a communication is established between the artery and the opposite vein. The blood forming this slow current coagulates upon the external surface, and in due time a vessel is thus formed between an artery on one side and a vein on the other of the wound."

Where a tooth or a piece of flesh is transplanted, and communication of course cut off on one side, the vessels are supposed to preserve their perviousness, and "if therefore a diminution of pressure, which was previously equal, be made at one end of a small incompressible tube, and if the other end of a tube be inserted in a liquid, a current will necessarily be produced, from one end of the tube to the other.

Is not this *ultra rem intendere?*

The suction of the auricles shows why valves are not necessary at the openings of the veins. The blood of the veins is supported by the atmospheric pressure; this is diminished in regard to the ventricles, and the blood being compelled to flow where the resistance is least, cannot on the contraction

of the auricles regurgitate into the veins: on the contrary, when the ventricles contract, the blood without valves at the auriculcular openings would regurgitate into the auricles, as the atmospheric resistance is less there than in the arteries; and when they relax, would without valves at the arterial openings experience regurgitation themselves from the arteries, on the same account. The fainting experienced on ascending elevated situations, is accounted for by the diminished weight of the atmosphere at these heights being unable to support the column of blood in the *cava inferior*, and transmit it to the heart with the usual force. The instantaneous relief obtained by the horizontal posture accords with this explanation. The same diminished pressure must produce the redness of the skin and the bleeding at the lungs mentioned by Saussure. Unless the blood were thus drawn up through the veins, it is impossible to conceive their thin coats capable of sustaining their columns of blood, as they do, and without even being much distended.

We come now to the appendix. As the resistance offered by the lungs against the pressure of the atmosphere, by relieving the heart from a degree of it, causes the venous blood to be propelled into it, so the same circumstance causes the diaphragm, the instant it is relaxed, to be driven upwards towards the chest. The vacuum which would occur is prevented by the entrance of blood and the ascent of the diaphragm, and affords an antagonist to the contractions both of the heart and diaphragm. As the heart after being distended by the blood contracts, so the diaphragm after being driven upwards contracts, and the elastic lungs become forcibly dilated by the air on account of the threatening vacuum in the thoracic cavity. The diaphragm ceasing to act, the elasticity of the lungs immediately expels the air, and the atmospheric pressure distends the unresisting diaphragm. The same applies to the intercostal muscles.

An objection presents itself against the assistance required by the heart from the elasticity of the lungs, on considering that the functions of the heart are performed in the fœtus, whose diaphragm is supposed to be in a state of complete relaxation, and therefore so drawn up into the chest as completely to fill the space which would be left by the undistended

lungs. This objection Dr. Carson endeavours to remove, by suggesting, first, that the circulation in the fœtus is not required to be very vigorous, from the paucity of secretions, the supply of heat afforded by the mother, &c. and therefore that the slight vacuity left by the mere relaxation of the heart's fibres is sufficient; and secondly, that the diaphragm most probably is not so stretched but that it is making a constant effort to contract, and to a certain degree succeeds, leaving a certain share of vacuum in the chest, which the venous blood is drawn into and destroys. Now, in the first place, we think the circulation in the fœtus is vigorous enough to require the assistance derived from the relief of pressure upon the heart, unless the suction from the mere relaxation of the heart is greater than Dr. Carson conceives; and, in the next, allowing the explanation to be satisfactory in regard to the human fœtus*, it cannot hold good in regard to the fœtal bird, which has no diaphragm. If this review should meet Dr. Carson's eye, we request him as a favour to explain his ideas of the heart's action in birds and reptiles, which have no diaphragm, and whose respiration is not therefore carried on by a vacuum formed or threatened in the chest, but simply in the lungs. The structure of these animals inclines us to believe that Dr. C. has overrated the effects of the diminished pressure upon the heart, and underrated the suction influence of the mere relaxation of the muscular fibres, suggested by Dr. Wilson.

Mr. Hunter remarked (*on the Blood, &c.*), that the muscular coats of arteries bore a greater proportion to the elastic as the vessel was more distant from the heart. Bichat absolutely denied muscular power in any but the capillaries, and Berzelius was unable to discover any fibrin in what is called the muscular coat of arteries. To ascertain whether arteries possess the properties of muscular parts, Dr. Parry repeated an experiment of Mr. Hunter's. Two ligatures were made upon an umbilical chord, before its separation from the fœtus. The

* The case of the fœtus appears to us exactly the same as after birth. The lungs being undistended, a vacuum is threatened, but is prevented by the ascent of the diaphragm and the entrance of venous blood, which will besides regularly enter exactly in proportion to the space left by the successive exits of arterial blood.

blood being thus retained, and a fresh ligature being made the next morning at some distance from the remaining one, all the vessels appeared turgid with blood.

"The placenta being then placed below, and the chord held up in a perpendicular direction, so that no blood could escape by its own gravity, the chord was cut through between the ligatures. The blood immediately sprang out with considerable force, and even for some short time continued to ooze from one of the arteries, leaving the orifices of both much more patulous than in the two former experiments (made immediately after the separation of the chord). Another ligature was made farther on, and the intervening part cut through, with precisely the same effects as before. All the portions thus divided were put into clean water, and laid aside until half past five on Sunday. The various sections being then examined, no difference in the size of any of the arterial orifices from that of the preceding day could be perceived. So far indeed were these arteries from being fully contracted, that some of them still contained blood. The result of this experiment, therefore, differed from that of the two former, inasmuch as the tonicity of the arteries seemed to have been totally or nearly lost, previously to the several sections."

In various other experiments, arteries were exposed, and their circumference accurately measured. On killing the animals, the circumference was instantly diminished, and after the lapse of nearly or more than a day, increased again, showing the muscular powers of the vessels, contracting like other muscles on death, and losing their power with the cessation of vitality. By bleeding animals to death the arteries become at first extremely contracted, though from the debility necessarily ensuing, the loss of the contractile powers, and the consequent dilatation by the elasticity of the vessels, sooner occurred than in death produced in other modes. The arteries thus appear to possess a muscular and an elastic power, and to be during life in a state of forced distention. In order to enquire further into this point, two ligatures, distant from each other an inch and a half, were at the same time drawn tightly upon the carotid of a living sheep. The vessel half way between them was $\frac{200}{400}$ of an inch in circumference; the blood being let out of the

included portion by a puncture, the same part measured but $\frac{160}{400}$ of an inch; $\frac{40}{400}$ of an inch less: from which, and a similar experiment upon a horse, it appears that the distention of the artery does not necessarily depend on the impulse of the blood during the systole of the left ventricle, because all communication with the heart was intercepted. The degree of distention will vary under different circumstances. It was generally increased in a vessel upon tying that of the other side. It is singular that on exposing arteries, a contraction of a small portion, sometimes forming a mere ring, frequently took place, with a corresponding augmentation of the part just before it. Unless the arteries were kept in a tense state by the strong tendency of their muscular and elastic coats to contract upon the blood, this fluid would not be propelled onwards as it is; it would accumulate, instead of moving forwards. The arteries may thus be viewed as sphincters constantly making an effort to contract, and antagonized by distending fluids. The advantage of a combination of muscular and elastic substance is very great. The elastic relieves and strengthens the muscular, and the muscular prevents the elastic from being so stretched as to suffer any loss of its elasticity. It may be well to subjoin a statement of their respective effects observed in some of Dr. Parry's experiments.

"The carotid of a living ram having been detached from all the surrounding parts, its circumference was accurately measured with some fine thread, and found to be $\frac{260}{400}$ of an inch. The animal was then killed by a cord passed round the trachea, without including any other part. The artery being again measured precisely in the same spot, within five minutes after apparent death, was found to be in circumference only $\frac{190}{400}$ of an inch. Thus the circumference appeared to have been reduced $\frac{70}{400}$ of an inch. In order to discover whether any, and how much, of this reduction depended on tonicity, it was presumed that a subsequent period might be found, when the tonic contraction would be entirely lost, and the artery would be brought to that state which was the result of the mechanical power of elasticity. Accordingly, twenty-one hours and a half after the last measurement, putrefaction having already begun about several parts below the diaphragm, the artery was

measured in the same place a third time, and proved to be in circumference $\frac{222}{400}$ of an inch. Hence the whole contraction of the circumference is $\frac{70}{400}$ of an inch, that by tonicity was $\frac{32}{400}$ of an inch, and that by elasticity $\frac{38}{400}$. In another ram, the circumference of the carotid before death was $\frac{379}{400}$ of an inch. The animal being killed by strangulation, as before, the vessel, measured in the same spot, six minutes after the first application of the ligature, was found to be in circumference only $\frac{270}{400}$ of an inch. Being again measured nearly twenty-four hours afterwards, its circumference was $\frac{320}{400}$. Here then the tonicity was as $\frac{50}{400}$ of an inch, and the elasticity as $\frac{59}{400}$."

Arteries thus seem endowed with considerable muscular powers—such as before their life is lost are able completely to overcome the elastic power; and if arteries possess irritability in this degree, that of the capillaries must be great indeed.

We now proceed to enquire into the cause and nature of the pulse. Haller, Dumas, Richerand, Portal, Sœmmering, Hales, Hunter, and most moderns, ascribe the pulse, more or less, to the dilatation of the arteries during the systole of the left ventricle, and some of them also to the locomotion of the vessels. Bichat ascribes it entirely to the latter. Jadelot attributes it to the resistance made by the blood to the finger, or whatever else diminishes the canal along which the blood is moving with increased impetuosity when the left ventricle contracts, and this has always been our opinion of its nature. Indeed, every surgeon knows that on exposing an artery, no increase of size is apparent when the pulsation occurs. Dr. Parry has certainly not the merit of originality in the doctrine which he proposes with regard to the nature of the pulse, but he has that of fully establishing it. In a number of observations, the most careful examination did not discover the least change of bulk in arteries during the systole or diastole of the ventricles. The blood in every part of the arterial system, from the initial valves, onwards through the whole frame, to the right auricle, may be considered as a set of continuous columns, possessing little compressibility, and filling the tubes in which they are contained. When, by the contraction of the left ventricle, the blood included in it is forcibly expelled into the *aorta*, all these columns receive the shock of propulsion at

the same moment. But the velocity during this systole, being greater than during the diastole, the *momentum* and consequently the impulse, in every direction, is also greatest in the systole. When, therefore, an artery is compressed with the fingers, in the usual mode of feeling the pulse, the blood, in consequence of the systole rushing into the artery with an increase of *momentum*, gives a stronger impulse of dilatation to the fingers, than from the less *momentum* which exists during the diastole, and thus produces the phenomenon of the pulse. Hence it appears that the pulse is the effect, not of an extension of an artery beyond its usual diameter, but of a stronger effort, during the systole of the ventricle than during its diastole, to restore the usual diameter of the artery, which had been diminished by compression. Since also the excess of velocity from the systole extends throughout the whole of the space compressed by the fingers, it is evident that the distending effort, producing the sense of pulsation, must also be felt throughout that space. Before this explanation could be fully admitted, it was necessary to ascertain the cause of the converse of this state, or the reason why a pulse was sometimes wanting in an artery exposed to the view, and susceptible of any mode of examination by the touch (an occurrence which sometimes took place in Dr. Parry's experiments). Reiterated trials demonstrated, that this deficiency was owing to the following circumstances.—The coats of the carotids are so firm, that when either impelled against any soft substance, or simply moved out of their place, these arteries readily recede, suffering no reduction of diameter, and therefore giving no sensation of a pulse. But if they are confined by any hard substance placed behind them, so as to resist a change of position from the pressure of the finger, or if they are squeezed between the finger and thumb, so as, in either case, to suffer a certain reduction of diameter, then the pulse never fails to exhibit itself. These latter experiments, therefore, while they show that the pulse does not exist under the mere contact of the finger with the artery, and therefore completely refute the supposed dilatation of an artery by the systole of the ventricle, as an object of touch; by ascertaining the precise circumstances under which a pulse does or does not

exist, demonstrate, beyond all reasonable objection, the nature of that phenomenon. Hence we see the probable reason why no pulse is said to have been discovered in some surgical operations. If, however, the principle as to both states be well established, we have only sufficiently to diminish with the finger the diameter of an artery, and then, if it be of a certain size, and the course of the blood through it from the heart be interrupted, we shall not fail to feel the pulse in that artery. It is obvious that pulsation cannot be expected in small vessels, because the stream is in them quite equable, and were it not so, its minuteness would render imperceptible its effort to overcome a resistance.

A longitudinal motion was often remarked in Dr. P.'s experiments, when the left ventricle acted, throwing the vessel into somewhat of a curvilinear direction, and this locomotion is probably sometimes the cause of a visible pulsation, such as is seen in the lower part of the carotids of nervous women, &c.

From the facts ascertained in Dr. Parry's experiments and observations, he finds an explanation of many anomalies in the pulse. Thus in a youth, seventeen years of age, recovering from typhous fever, the pulsations of the left radial artery were like those of the heart, ninety in a minute, while those of the right were a hundred and eighty. The true stroke was sharp and hard, while the secondary was perceptible only when a very slight pressure was made upon the vessel, and ceased when the pressure was increased, or the artery confined. In twenty days this double pulse vanished. The same effect could, the patient said, be produced at any time by violent exercise. It seems probable, that during the systole of the left ventricle, the impulse of the blood produced some locomotion in the artery, perhaps from the laxity of its connexions, and that a secondary pulse was felt when the vessel was recovering its situation.

As the true pulse depends upon the action of the heart, it always corresponds with it. This we all know, yet some have asserted that they have found arteries pulsating without any correspondence with the heart's motion. This, in the case just mentioned, depended upon the artery. Sometimes the arterial pulse is only half as numerous as that of the heart. This may

arise from an affection of the auriculo-ventricular valves, by which a regurgitation occurs into the auricles, and their action is rendered so strong as to be felt externally: or from any circumstance which renders the contraction of the auricles unusually forcible. In several cases no pulsation could be found in the arm, although no change was observable in other arteries or the heart, or in the general health. Some recovered, others died, and dissection discovered nothing peculiar. There probably was a spasmodic constriction of some part of the arterial trunk of the arm, such as was sometimes observed when arteries were laid bare; for in these instances, and where a ligature was made on the artery, so as to diminish its circumference to the same degree, the pulsation beyond the ligature was extremely faint.

The common varieties of the pulse are quick or slow, large or small, hard or soft, and sharp, or irregular in these respects. These are all easily explained by the doctrine of the pulse being the impulse given to the blood from the heart. On quickness and slowness we need say nothing. The magnitude may depend upon the quantity of blood in the sanguiferous system, and upon the dimensions of the vessel itself, without relation to this. Hardness and softness may depend upon the degree of force with which the blood is propelled from the heart; sharpness upon the rapidity with which each contraction of the left ventricle occurs, giving the *pulsus celer*, while the frequency of pulsation in a given time, gives the *pulsus frequens*. Irregularities in these points are easily explicable.

Besides these, many other varieties are mentioned by authors, not easily to be explained nor more easily to be comprehended. We will say a few words upon those to gratify the curiosity of our young readers. The Chinese have the most ancient observations on the pulse. They compared its varieties to many circumstances—one to the pecking of a bird—another to the irregular fall of leaves from a tree—a third to a pole—and a fourth to a man pulling off his girdle, or, who when wishing to wrap up something, has not stuff enough to enclose it—a fifth to the motion of the roots of certain plants which first swim and subsequently go to the bottom (*Duhalde's History of China*). Many of the Chinese distinctions are

similar to those of the Greek writers, and Bordeu, with much probability, supposes both Greeks and Chinese to have been indebted to the Egyptians for their opinions (*Recherches sur le Pouls*). Avicenna and others treated of the pulse musically, and Hoffenreffer in 1641 published a singular scale of the pulse, which was soon followed by similar performances by others, exactly analogous to a musical scale, reducing all pulsations to musical time, and marking by semibreves, minims, and crotchets, semiquavers, and demisemiquavers. Solano described various conditions of the pulse, as predicting a crisis, by purging, vomiting; and many followed up his observations with an infinity of others equally unsatisfactory, such as the nasalis, indicated by *portionis brachialis spatii pulsantis inflatio, cum planitie inusitata, et sensu formicationis quasi granularis parte digitali*, and the gastric indicated by *elevationes spatii pulsantis pyramidales inter indicem et digitum medium, qui sese rapide et irregulariter succedunt.* Those who are curious on these points we refer to Haller, Horstius, Bordeu, Falconer, Bellini, Hoffman, &c.

A further power of arteries, unexpected, we will venture to say, by any of our readers, is contended for by Dr. Parry.

When an artery is obstructed, as in the operation for aneurism, its functions are supposed generally to be supplied altogether by the enlargement of the other branches of the trunk, which are dilated to some number at first, for immediate purposes, and in time collapse, with the exception of two or three, which remain permanently distended.

Dr. P. on the 27th of September was present at the ligature of both carotids in a ram: they came away on the 17th of October, and the animal was killed on the 7th of the following August, and its blood-vessels injected. A plexus of vessels was found running from the part of the artery before the ligature, to the part beyond it, sustaining a communication between the two portions of the vessel which the ligature had separated. Such vessels were never observed in rams under common circumstances; but in two others, in one of which the right carotid was tied, and in the other the left, a similar appearance was found, although probably from one vessel

being sufficient for the purposes of the head, the new vessels were few in number, and not quite pervious.

These facts deserve the enquiry of experimenters, and Dr. Parry has now three other rams, one with a single carotid tied, and two with both, and after a sufficient time has elapsed, the animals will be killed, and the appearance of the vessels made known to the public.

We cannot finish our account of these two very interesting publications, without expressing our satisfaction on finding that two physicians, whose lives have been spent in the active practice of their profession, feel sufficient ardour to prosecute enquiries, from which they cannot expect, at their period of life, any professional advantage. The ardour of young men may be justly often supposed to arise from hopes of professional advancement directly or indirectly accruing; but in other men, it must spring either from a love of truth, or of honourable distinction. The ardour for inquiry diminishes in most medical men with the increase of emolument, because too often felt only for its sake; and we wish that every medical man would, instead of being a mere practitioner, *secundum artem*, or a mere collector of fees, imitate the zeal and spirit of Dr. Parry and Dr. Carson.

Report of Observations made in the British Hospitals in Belgium after the Battle of Waterloo; with some Remarks upon Amputation. By John Thomson, M. D. F. R. S. E. Consulting Physician to the Edinburgh New Town Dispensary; Professor of Surgery to the Royal College of Surgeons; Regius Professor of Military Surgery in the University of Edinburgh; and Surgeon to the Forces. Edinburgh, 1816. 8vo. pp. 281.

[From the Annals of Medicine and Surgery, for December, 1816.]

The high additions to the name of the present author entitle us to expect very much; and we believe no man is better qualified than Dr. Thomson to make a report like the present.

His extensive reading, his correct and cautious judgment, and his patience, candour, and docility, present a combination which few, if any, of his surgical brethren can boast. Though we must all bitterly regret, crowned with glory as we are, the accursed state of nations, drawn out against each other to aggravate intentionally the ills which at all times flesh is heir to; yet we must be pleased that one fitted for the purpose has endeavoured to draw what benefit could be drawn from the field of woe.

The first half of the work contains the REPORT, the second the REMARKS. We shall proceed to give a correct epitome of the former.

State of the wounded. The returns after the battles of the 16th and 18th June were nearly 2000 killed and 8000 wounded. The period was a few weeks earlier than the sickly season of Belgium usually commences. The Professor arrived at Brussels on the 8th of July, and consequently after the first period of inflammation and symptomatic fever had in most instances passed away. What symptomatic fever was still existing put on the bilious remittent or continued type, being evidently affected by the season and climate. This fever began to prove fatal by the seventh day after the battle, and continued to do so till the twenty-first, when the number of deaths suddenly became fewer. On proceeding to Antwerp, the low situation of the place, and the high temperature of the atmosphere, rendered the aspect of sores less healthy than they had been seen at Brussels. They had a tendency to slough, and were, in many cases, passing to a state of hospital gangrene: bilious remittent and intermittent fevers were attacking convalescents, and a bilious symptomatic fever had been severe and fatal. The skin of these bilious patients was deeply yellow, and the absence of black vomiting was the only circumstance which distinguished their case from yellow fever. In general no obstruction or alteration of the liver was observable after death. On returning to Brussels on the 29th of July, violent bilious fever was found to have succeeded some operations, and hospital gangrene was commencing. This disease, though usually infectious, appeared endemial, prevailing proportionately with the endemic diseases of the country. It was accom-

panied by fever and great topical inflammation at Brussels, requiring blood-letting and mild applications, whereas at Antwerp the applications of strong acids, potash, sublimate, arsenic, &c. arrested its progress without exciting inflammation. A few cases of dysentery were found in men who had been removed from low situations, but the disease was not communicated. From the great assiduity of the medical department, upon whom Dr. Thomson bestows great and most just praise, no infectious fever was allowed to occur. Even the hectic fever assumed a bilious form, and was distinguishable from the bilious intermittents and remittents of the country, principally by the absence of the furred state of the tongue, and of the peculiar oppressive sensations about the epigastrium. The zeal and humanity of the inhabitants of Brussels equalled that of the medical department. The day after the battle

"The shops were shut, the people were at their doors, administering cordials, and offering dressing to the wounded, taking the tenderest care of them. The most delicate females and people of all ranks were occupied in this manner. Hundreds of wounded were to be seen in the streets, and some were to be found in every house. Even after the hospitals were fully established, several hundreds of privates, besides the officers, were voluntarily received and taken care of by the inhabitants during their cure. In the course of our visits to the wounded officers, in private quarters, we had frequently occasion to observe the sacrifices which the inhabitants cheerfully made of their accommodations and comforts to their wounded guests, the personal services which they rendered, and the kindness they showed in presenting them with wine, fruit, and other luxuries."

Different kinds of wounds. The incised wounds were seen chiefly in the French prisoners at Antwerp, and were chiefly sabre cuts, and for the most part about the head, neck, and shoulders. Dr. T. censures as bitterly as we did in a former number the unwillingness of the French to attempt union by adhesion.

"I have been surprised to see the practice of stuffing sabre wounds persisted in, till the growth of granulations and the occurrence of cicatrization rendered it impossible to continue

it any longer. If English surgeons err, as I am afraid they sometimes do, by applying too much adhesive plaster to the surfaces of wounds, and by leaving no interstices for the escape of pus and other fluids, the French certainly lose a great deal of time, and often occasion an unnecessary degree of pain, by the indiscriminate use which they make of dry lint."

The punctured wounds had been chiefly inflicted by the lance, few by the bayonet; whence they were larger, more frequently fatal in the first instance, and more disposed to heal quickly and quietly. Tetanus rarely occurred, and when it did, was unusually mild and chronic.

The contused and lacerated wounds had been occasioned by cannon-balls, cannister-shot, and pieces of bombs. The Professor takes occasion to express his coincidence in opinion with Vacher respecting injuries occasioned by the wind of a ball. Vacher supposes that in such cases some of the great cavities had been struck by a spent ball, with force sufficient to contuse or even rupture some of the contained organs, without occasioning any external marks of injury. In opposition to the hypothesis entertained by Mr. Ellis, of such accidents arising from electricity generated by the passage of balls through the air, he states that

"He saw, and was informed of, many instances in which cannon-balls had passed quite close to all the parts of the body, and had removed portions of the clothes and accoutrements without producing the slightest injury of any kind. In other instances, portions of the body itself were removed by cannon-balls, without the contiguous parts having been much injured. In one case, the point of the nose was carried off by a cannon-ball, without respiration being at all affected; and in another very remarkable case, the external part of the ear was shot away without even the power of hearing being sensibly impaired."

Some instances were seen of the singular phenomenon of the stop put to the flow of blood through large arteries in contused or lacerated wounds. On amputating the knee of a man whose leg had been shot off by a cannon-ball, the arteries did not bleed, nor did they afterwards require any ligature. Two cases have been seen by Dr. T. where the pulse at the

wrist ceased in consequence of the passage of balls through the fore-arm, near the brachial artery, and two where the pulsations at the temple were stopped by balls passing across the region of the ear.

"In none of these cases was the hemorrhage such as to induce me to believe that the arteries had been divided. The closure in these instances may have been produced, either by the rupture of the internal coats from the impulse of the ball, or by the communication of inflammation from the canal of the wound to the arterial tube."

The far greater part of the wounds were from musket-balls, and therefore properly of the kind called gun-shot. In their simplest state they are often very difficult to heal, probably, as Dr. T. justly suggests, because they partake of the nature of both contused and punctured wounds; having, like the former, narrow openings, and being, like contused wounds, attended by slight hemorrhage and pain in the first instance, from the contusion of the parts. The curious course of balls along or around parts is well known, but Dr. T. had reason to believe, from several dissections, that balls may enter cavities and take the concave direction of their inner surfaces, running for some way between their parietes and the contained viscera. Balls are frequently split, and either each piece takes a different direction, or one remains in the spot while the other passes on. The most frequent examples of this kind occurred in the cranium. The investigation of the circumstances which indicate or contra-indicate the dilatation, remote or immediate, of gun-shot wounds, is recommended to military surgeons.

"From the rule, which was certainly too indiscriminate, to dilate in every case of gun-shot wounds, we are probably passing into the other extreme, of dilating but seldom, or not at all. That practice, however, is indispensably necessary in cases in which it is proper to expose to view and tie a bleedding artery; and it may be extremely useful whenever it can lead to the discovery, or faciliate the extracting of foreign bodies of any kind."

Hemorrhage is probably the great cause of death upon the field of battle. Secondary hemorrhage arises from various

causes. If from increased determination of blood forcing open the recently closed mouths of divided vessels, it occurs usually from the first to the fifth day: if from the sloughing of contused vessels (a frequent occurrence in contused wounds), usually from the fifth to the tenth day; if from ulceration, at any period. Secondary hemorrhage sometimes occurs in stumps and the canals of gun-shot wounds, without any vessel being discoverable which afforded the blood. It commonly happens from the twentieth to the thirty-fifth day, though sometimes earlier or later; and is always preceded by heat, pain, and throbbing in the bleeding surface, and is generally in the case of persons of full habit after too great indulgence in food. It strongly resembles the active hemorrhages of mucous membranes, and is to be combated by the same antiphlogistic measures. Those who obtained too great an allowance of wine and animal food, suffered most from hemorrhage among those who were seized with it after the twentieth day, and it consequently seemed produced more by increased determination of blood than by any other cause.

After these general remarks, the injuries of each region come to be considered; and first,

Wounds of the head. Portions of brain were frequently lost without much mischief. In one example, where a portion of the occipital bone and dura mater was removed, the brain protruded, with a slight stupor and loss of memory, but retired together with the unfavourable symptoms, when the inflammatory disposition was subdued. This was the only case in which the removal of a part of the cranium was attended by a disposition to protrusion of the brain.—When paralysis ensued, it invariably attacked the side opposite that which was the seat of the wound.* There was no other relation between the seat of the injury and that of the paralysis.

* Drs. Gall and Spurzheim (*Spurzheim's System of Physiognomy*, p. 31—3,) remark, that all the fasciculi of nerves, both of the cerebrum and cerebellum arise on the same side of the cerebral mass to which they belong, except those of the anterior pyramidal eminences, which decussate each other. They hence explain why compression of the brain affects sometimes the same side of the body, and sometimes the opposite: it will affect the same side if it exist any where but upon the anterior pyramidal eminences, and there it will produce paralysis of the opposite side of the body. The truth of this may be readily ascertained by morbid dissection.

"A wound of the right parietal bone by a musket ball was followed by palsy of the left arm and leg. In another case, a wound penetrating the upper part of the right parietal bone, was accompanied by a slight paralytic affection of the left side of the mouth, and complete palsy of the left leg. In the third case, a sabre wound of the same bone, followed by extensive exfoliations, gave rise to a complete palsy of the left side."

Stupor and paralysis were generally produced by contusion, but were sometimes occasioned by extravasation or depressed bone: sometimes they ceased on the removal of compression, and sometimes continued after all apparent compression was removed; while, on the other hand, great depression of bone was unattended by stupor, paralysis, or loss of memory. The pulse was usually irregular in the cases of compression. The pupils were sometimes dilated when the head was injured; once the right pupil was dilated, and the left unaltered; in another case, one pupil dilated, and the other contracted, and strabismus was a frequent occurrence.—Diffused secondary inflammation of the brain and its membranes was rendered a rare occurrence by the strictness with which the antiphlogistic regimen was enforced.—The absence of fungus in numerous cases of partial loss of cranial bone, and the appearance of similar growths over a contused portion of the brain, where no bone had been lost, makes it undoubtedly probable, that they are occasioned by contusion and not by the loss of resistance. In the cases of fungus, the common symptoms of compression were present.—Convulsions arose in a few instances, where portions of the cranium were driven upon the brain, but ceased in several cases after the removal of the depressed bone, and the strict observance of strong antiphlogistic measures.

Wounds of the Face. Some balls had passed through the frontal sinuses into the cranium; others simply into the sinuses; others from one temple right through the orbits, not affecting the cavity of the cranium, or not affecting the eyes, or passing through the eye-balls, or dividing the optic nerves; loss of sight without any appearance of injury in one or both eyes, or the occurrence of violent inflammation, or the former state in one eye and the latter in the other, was a frequent

consequence of the passage of balls only near the eyes. The bones of the external meatus auditorius and the mastoid processes, were frequently fractured without injury of the brain. Some bullets that had entered the mouth were immediately spit out; others lodged in different parts, and others passed on, sometimes piercing the tongue or carrying a greater or smaller portion of it away. In the latter cases the speech was not much impaired.*

Wounds of the Neck. The hair-breadth escapes in cases of this kind were really extraordinary. No wounds of the carotid artery or internal jugular vein were seen, and probably because such proved fatal immediately. No unequivocal case of a wound of the œsophagus was observed. Wounds of the larynx were often attended by hoarseness, cough, exfoliation of cartilage, and all the sympoms of consumption.—Where some of the cervical nerves were wounded, more or less paralysis of the extremity sooner or later was induced, attended with much pain or with severe pain in the part injured.

Wounds of the Chest. The hemorrhage from the external wounds was readily suppressed by compresses and bandages, and no ill effects ensued, as might have been supposed, from internal accumulation of blood. In no instance was discolora-

* The tongue is so commonly regarded as the grand organ of speech, that to lose one's tongue, and to have a long tongue, &c. are proverbial phrases. Yet testimony analogous to Dr. Thomson's is on record. A girl born without a tongue is mentioned in the *Mémoires de l'Acad. des Sciences de Paris*, 1718, p. 6, who talked as distinctly and easily as if she had enjoyed the full benefit of that organ, and the physician who wrote this account refers to an instance published eighty years before, of a boy who retained the faculty of speaking after losing his tongue by ulceration in the small-pox. Similar instances are related by Louis, Richter, Huxham, Bartholin, Tulpius, &c. Dr. Berriman, in his Historical Account of the Trinitarian Controversy, relates, among the wonders of the early Christian church, that an orthodox party in Africa had their tongues cut out by Prince Hunneric the Vandal, of the Arian party, and that all, excepting two, most *miraculously* were all able to talk afterwards as well as before. Yet whether doubting (as he well might) of its being really a miracle, or wishing, like many other short sighted and very questionable Christians, to exalt Christianity by *pious* lies, he adds, (*ô hominis impudentia!*) what those who set the least store upon their tongues will not believe; that "of these poor sufferers one who had been dumb from his birth, yet by losing his tongue with the rest, acquired also the use of speech."

tion of the loins observed from infiltration of blood, a symptom, said by Valentin to be characteristic of extravasation into the cavity of the pleura, and confirmed by M. Larrey. In three cases where balls had lodged in the cavity of the chest, the patients appeared hastening to convalescence. Inflammation and hemorrhage were vigorously opposed in all these wounds by venesection. One patient was bled to the amount of 250 oz. in eighteen days. In two cases a ball passed through the chest and lodged under the scapula, and in ten had passed out through the scapula. In three the reverse happened: the ball entered through the scapula and passed out through the front of the thorax. In two, it had passed through the chest from side to side. Emphysema rarely occurred; in one instance, the puffy tumour which it formed was cut into, and air and bloody serum discharged with great relief. In cases of suppuration, the wounds were in some cases open, in others, closed. When the opening is high and narrow, the *Professor* thinks advantage may be often gained by a counter opening lower down, and suggests as a prize question, "*What the* cases of wounds are, in which tents and tubes may be useful, or in which they are likely to prove injurious?" When the wounds had healed during the pleuritic inflammation, pus was often secreted, occasioning rigors, dyspnœa, especially on the opposite side, flushed cheeks, purple lips, and enlargement and dull sound on being struck, of the affected side. An opening for the escape of the matter gave great relief, and one poor Frenchman, who obstinately resisted the operation, *died* of empyema, in great agony. Wounds of the diaphragm were frequently recovered from, and were unattended by risus sardonicus, or convulsive motions of the chest.

Wounds of the Abdomen. Twelve cases of wounds of the liver were seen. Bile was discharged through the parietes of the abdomen in some, through the lungs in others. No effusion of bile into the abdominal cavity was ever observed. In one case, some bile was found, in a kind of abscess, between a wounded part of the liver and the diaphragm, but was prevented by adhesions all around from flowing into the cavity of the peritoneum. Jaundice was not observed in cases of wounded liver, except in two cases when it was suspected to

be of the same nature as the yellowness which attended the symptomatic fever of wounds in many other parts. Two cases only of wounds of the stomach were seen, from which the patients were recovering. In twelve cases of wounds of the intestines, from which recovery was taking place, no protrusion of the bowels occurred, As usual, patients seldom survived wounds of the *small* intestines. Those of the large often heal without difficulty. It is now established, that intestinal openings, whether by external injury or sphacelation, are best left to themselves, bleeding and the antiphlogistic regimen being vigorously practised.

"In a very singular case, in which a musket ball had entered the abdomen, a little way below, and to the left side of the umbilicus, and had come out on the same side, near to the spinous process of one of the lumbar vertebræ, a small quantity of fæces continued, during our stay in Belgium, to be discharged by the posterior wound, through the whole depth of the muscles of the loins. This man was sensible of voiding quantities of air along with his urine; and in the progress of his case, not only small quantities of air, but also of his urine, were distinctly observed to be mixed with the fæces which escaped from the wound. In this case, it seems probable, that an opening existed in the ureter of the side on which the wound had been inflicted. In another wound in the back, in the region of the kidney, urine was discharged by the orifice of the wound, for twenty-five days. During this time, the quantity of urine voided by the urethra was considerably diminished, and the patient had suffered, and continued to complain of great pain in the course of the spermatic cord."

No fewer than fourteen cases, in which the bladder had been penetrated by a musket ball, were seen in progress towards cure. In two instances the wound of the bladder was complicated with one in the intestines. The urine was discharged generally from both orifices, though sometimes only from one. The use of a flexible catheter, to make the urine readily escape by the natural passage, was highly beneficial. The urine was never known to escape into the abdominal cavity. In several instances balls had passed through the pelvis, without injuring either the bladder or intestines.

Wounds of the Loins and Pelvis.—These were wounded in every possible direction; and it was extraordinary, how the blood-vessels and nerves gave, in numerous instances, no signs of injury. Paralysis frequently accompanied gun-shot wounds, where the ball had passed across the loins, and through the region of the pelvis. It was complete or partial; and usually, but not always, took place at the moment of the wound. Severe pain often affected the seat of the injury; sometimes the thigh, or the knee, leg, and foot. Both extremities were seldom affected.

Wounds of the inferior extremities. Balls whose direction was towards the hip joint, generally lodged, probably from the depth of the solid parts which opposed their progress. Synovia was, in many instances, discharged from the hip joint for some time. Large portions of the thighs and buttocks were seen, carried off by cannon-balls, and the wounded surface looked, at first, gangrenous, and afterwards smooth, like glass, in spite of the utmost attention. The muscles of the thigh often protruded; the thighs were seen penetrated by musket-balls in all directions, and these wounds healed, for the most part, readily. Secondary hemorrhage, from the sloughing of the femoral vessels, was a frequent occurrence. In one case, the hemorrhage had come from the femoral artery, so near the groin, that it became necessary to cut down upon, and tie the external iliac artery. The femoral vessels, like all others, had numerous wonderful escapes, and, in two instances, were exposed by foreign bodies without bleeding. Many wounds of the thigh were complicated with fracture. Dr. T. very properly recommends the extended position of the limb, in fractures of the thigh, according to the French mode.

"It is only by placing the limb in the extended position, that it is possible to judge of the degree of shortening and distortion, which have taken place in the limb; and it is in this position only, that we can propose to remedy these, by making, from time to time, such extension of the limb as the soft parts may admit, and to counteract, by position, splints and bandages, that tendency to displacement of the fractured bone, and distension of the limb, which are produced partly by the action of the muscles, and partly by the weight of the inferior part of

the extremity. We saw excellent effects produced in numerous instances, by the application of rollers to the foot and leg, while the soft parts, more immediately surrounding the fracture, were more gently compressed by the eighteen-tailed bandage, or by the bandage of Scultetus, applied so as to admit of, and to facilitate the discharge of the matter from the abscesses and sinuses which had formed in the neighbourhood of the fractures."

He bestows a similar praise upon the French, to what we ourselves did in a former number; like us, often recommending our treatment of wounds by adhesion to them, he holds them up as an example to us in the treatment of fractures.

"Nothing can be more laudable, or better deserving of the imitation of English surgeons, than the great pains which the French surgeons, in general, bestow upon the management of fractured limbs. If, in the earlier stages of their injuries, they sometimes err, by trusting too much to mechanical means, it would be unjust not to acknowledge, that they excel us in the after treatment, by the very great attention which is given daily, at each dressing, to the condition, position, and bandaging of the limb."

The local and constitutional effects of a large proportion of diseases of the knee joint, were extremely severe and fatal. When balls had passed through the knee joint, and fractured the ends of the bones, the synovial membrane and cartilages were found, upon dissection, in a state very analogous to that of scrofula. During recovery from wounds of this joint, it became swollen and stiff, having very much the appearance of white swelling, and was greatly, and often suddenly, relieved by a large number of leeches; violent erythematic inflammation, was not an unusual attendant upon fractures of the inferior extremities. Injuries of the ankle joint were almost as severe as those of the knee. The swelling was proportionately greater, but the constitutional symptoms were less severe.

Wounds of the superior Extremities.—Of these, there was of course, every variety, with numerous strange escapes of nerves and blood-vessels.

The second half of this work is upon amputation, and is

ORIGINAL PAPER.

On the Puerperal Fever of Northumberland.

BY JAMES JACKSON, M. D.

Northumberland, March 29, 1817.

DEAR SIR,

THE puerperal fever has lately appeared in this neighbourhood with great mortality: the mode of treatment, which I have partly taken from books, has proved very unsuccessful, and therefore I cannot but cast an anxious look to my preceptor in the obstetric art. During the winter there were so many lectures to be attended that we seemed to be plunged into an ocean of learning and science, in which we might say with the poet,

——— unda impellitur undâ
Urgeturque prior venienti urgetque priorem;

and this I hope will prove some apology for the deficiency of my notes on the present subject.

The sixth of November, a woman was delivered under my care, who was attacked with it but recovered. Six others whom I attended, during the subsequent four weeks, escaped it, and had a good getting up, except one, who had a pneumonic inflammation, that required four bleedings to subdue it. On the 23d of December, another of my lying-in patients, took the disease and died; and every woman that I have attended since that time has taken it, and all except one fallen victims to its fury.

You can judge then of the state of my mind, and I hope pardon the liberty I have taken of writing to you and requesting some advice in the treatment of this untoward disease. There are many women in this neighbourhood, who are far advanced in their pregnancy, and therefore I cannot but be particularly desirous of ascertaining the best mode not only of curing, but also of preventing the complaint. To answer

this last indication, I had almost determined upon the use of bark as recommended by some authors; and yet the onset of the disease has been so highly inflammatory, as to render it with me, a subject of more serious consideration.

The disease has, for the most part, answered the description of it in books, and therefore I shall only make a few observations, for I should be very unwilling to trouble you with a long and tedious narration.

The first case was cured by bleeding, purging, and fomenting the abdomen with flannels rung out of hot water. Injections were not admissible for particular reasons. The pulse was full and strong, bút not tense, blood inflammatory, headach and abdominal pain severe, stools black and offensive, the milk and lochia suppressed for five days. The disease gradually subsided without running into the typhoid state.

In this part of the country, I am very frequently called to visit women in the puerperal state, with inflammatory fever, apparently induced by the hot regimen of the midwives and nurses, and therefore I was the less alarmed in the present case, though I observed at the time many symptoms very different from any I had before met with in this vicinity.

In the second case the patient was delirious at the first attack, the abdominal pain and headach soon became very severe; pulse large, bounding 130 in the minute, and somewhat tense. In this case the blood was not inflammatory at the first bleeding, which was seven hours after the attack; but considerably so at the second, which was four hours later. On the second day, about the 17th hour of the disease, I was about to bleed her a third time, but believing that I discovered something of a typhoid action lurking under fulness and apparent strength, I determined to wait the event of a few hours.

In the afternoon, the porraceous vomiting came on, which reduced her at once to a typhus state. Stimulants were then given, beginning with opium, Huxham's tinct. and the aromat. sp. of amm. Towards the last vibices appeared over the whole body; she lived sixty-six hours from the attack, and died without any symptom of suppuration or gangrene. The body went rapidly into putrefaction.

In the third case, the woman appeared pretty well for five

days, the milk was secreted copiously, and the lochia were in proper quantity. About this time, I observed a sharpness of the voice, which gave me some uneasiness; soon after she complained of ringing in her head, and there were now some slight symptoms of fever. On the eighth day she had a severe chill followed by fever, pain in the abdomen and suppression of the milk. She had been for some time in a bad state of health, troubled in mind, and strongly prepossessed not only with the belief, that it was her fate to die in this confinement, but also with a strange desire of not surviving it.

She was neither bled nor blistered. The bowels were kept open, the abdomen fomented, and tonics administered almost from the very first. Her disease at once assumed the symptoms of the typhus gravior; vibices appeared over the whole body, and she died a mere mass of putrefaction on the sixth day.

The child sickened of a fever and died in a few days, with abscesses in various parts of its body. It did not suck after the first signs of disease in the mother.

Case fourth, was that of a woman who was delivered under my care, of her first child, the very day before the preceding patient was taken ill. Her labour was natural but severe, and lasted about sixteen hours. After she was put to bed, I observed that the pulse was fuller and more frequent than natural; but as I had bled her about twelve hours before for a thickened state of the os uteri, it was not thought proper to repeat the operation, and more particularly as the lochia were pretty copious. The weather was excessively cold, and she was therefore indulged with curtains and a good fire, but with nothing else that was heating or inflammatory.

About eight hours after delivery, she was taken with a chill, followed by fever and pain. Next morning I found her labouring under the puerperal fever, with excessive pain in the head and abdomen; the pulse was full, strong, and 120 in the minute. By moderate bleeding, purging, injections without number, and fomentations, this woman happily recovered, the disease going off about the seventh day, without assuming the typhoid character. This lady's agony was truly terrible to bear, and distressing to witness. For the first thirty-six hours I

frequently heard her moaning, when I was approaching the house. This was the only patient in the whole number, that was favoured with judicious nursing.

The child appeared to be healthy, and took milk and water, till about twenty hours after delivery, when, without any evident cause, it became purple and died, before it was a full day old.

About this time, I was called to a woman in Sunbury, in the seventh month of her first pregnancy, who was threatened with an abortion. Her pains were very slight, and the os uteri not at all dilated. She was bled freely and took opium, which quieted her pains, and I left her with the hope that she would pass a comfortable night. I was called to her towards morning, but before I arrived, she had been delivered of a dead putrid child. This woman continued well, for thirty-six hours, when she was taken with a chill which was followed by a fever and a copious flow of milk. This had well nigh deceived me; but a slight pain and swelling of the epigastric region, ringing in the head, with partial deafness, were pathognomonic of something more than the milk fever.

The pulse was small, frequent and somewhat tense. I need not mention the treatment, as nothing that I recommended was fairly tried. The neighbouring women crowded in, some were sober and others drunk, and every one did what seemed right to her own understanding. The woman soon sunk into typhus, and died on the sixth day.

The next case happened also in Sunbury, at the very time I was attending the preceding woman. Here I pursued the same plan of treatment, that has been already described, but the second day my patient sunk into typhus, and died on the sixth. It was found necessary to bury her in ten hours. The child did not suck, and was removed from the house, as soon as the mother was taken ill. It, however, sickened and died in a few days, with abscesses in various parts of its body.

The seventh and last woman was delivered by a midwife at my request, as I was lame in one hand and unable to attend; but the secundines not being expelled in due time, I was called upon to render assistance. This was afforded, by the introduction of the fore finger, for the placenta was lodged

in the vagina, and upon being raised at one side, was expelled by the pains.

This woman was seized on the evening of the second day, and during the night was immoderately heated with bricks, and tea of pennyroyal, or the mentha pulegioides. Next morning I was called; I found her labouring under the fatal epidemic. The pain of her head and abdomen had been excruciating all night, the epigastric region was swelled, pulse 130, pretty full and strong. Twelve ounces of inflammatory blood were taken, salts and injections administered freely, and fomentations applied to the abdomen. She was soon relieved of most of her pain. No more blood was taken, but the other means were continued for two days, when there was hardly a symptom of the disease left. The skin was cool, tongue becoming moist and clean, pulse 92, headach gone, there was no pain in the abdomen, even when she coughed severely, and she had slept comfortably most of the preceding night.

Her excellent nurse now left her under the care of the family. Every thing was done wrong; when I prescribed injections, they gave her dose upon dose of salts; they damped and chilled her with fomentations carelessly applied; and the disease was soon changed into a violent inflammation, the character of which I did not detect, until it was too late to afford relief, considering it merely a relapse into her former complaint.

I had now no hopes, but from a moderate suppuration. In this too I was disappointed, for the inflammation proceeded with great rapidity, and in two days had involved the whole abdomen and thorax. She had been tending towards a consumption for some time, and had then a severe cough which aggravated all her symptoms. She died of pure inflammation on the eighth day.

In the preceding account, there was much omitted for the sake of brevity, which may now be brought into a collective view.

Porraceous vomiting was a very common symptom, but the two women that recovered, escaped it altogether, they threw up only the common contents of the stomach. In the typhus stage, opium, Hux. tinct. and the aromatic sp. of ammon.

were found useful in checking the vomiting, which was now sometimes completely black. Porter was not within our reach, and the effervescing draught was not tried, as there were no nurses of skill to administer it. The fomentations were always agreeable when properly applied, and succeeded in three cases to my entire satisfaction, but in all the rest I have reason to believe they were hurtful from the careless or ignorant manner in which they were applied.

Why they should be useful, I cannot determine; but certain it is, that they always afforded comfort, except in the last stage.

The blisters I am afraid afforded no relief, and perhaps were rather an additional irritation, their effects being altogether inadequate to the violence of the disease. Neither emetics nor nauseating medicines were tried, for I could not persuade myself, that artificial vomiting could be useful, where the spontaneous proved so painful and destructive. Even that which came on at the very first attack, proved very terrible to the poor patient, who would frequently cry out in anguish, "Oh if it were not for this vomiting."

Injections always gave present relief, frequently bringing away large fœtid black stools, and a prodigious quantity of wind. In some cases the womb was washed out with large injections of warm water, which sometimes brought away clots of blood, and always afforded some present comfort.

The milk after the second day was always absent; the lochia continued more or less in every case, except the first, during the whole course of the disease.

During all this time, the midwives in the neighbourhood attended four, and a physician in Sunbury one woman, all of whom escaped the disease, though none of them had what we call a good getting up. I began to think that it occurred only in my own practice, till a few days ago, when the physician of Pennsborough, twenty-seven miles up the river, informed me that one of his patients had taken the disease and died in two days, and that a woman of Milton, who was delivered by the medical gentleman of that place, took it and survived the chill only twenty-four hours. In both cases, typhus supervened very early.

In one case only was the labour severe, in all it was natural, and the placenta came away entire with the uterine pains, without any assistance on my part, except in the last case, when, as I mentioned before, only the finger was introduced.

Three of the women that died, were of an unsound state of body, and in every case except two the nursing was the worse that could be described; so that probably the disease in more skilful hands, and under more favourable circumstances, would be attended with less mortality.

The prevailing brumal fever of this place, has been for several years the synochus of Dr. Cullen, the first stage of which, has been highly inflammatory, and very commonly attended with enteritis or pneumony. Some cases have occurred early in the winter; but it is most common from the middle of February to the middle of April. In good constitutions this fever may very often be cured, by moderate bleeding, and other suitable remedies, without running fairly into typhus, coming to a laudable crisis sometimes as early as the fifth day. But either too much bleeding, or a too early use of stimulants, will certainly protract it into typhus. I have known some ignorant practitioners mistake the disease for a pleurisy, and reduce their patients in a few days, below the reach of medicine.

This fever, which in Northumberland is commonly called typhus, generally falls upon the lungs of the intemperate, and is then almost certainly fatal.

About thirteen months ago, I was called to a woman in the seventh month of her pregnancy, who was labouring under this disease, with pneumonic inflammation. The typhus stage appeared to be at hand, and she was therefore not bled. She had had a severe cough for several months, which was now redoubled in severity, and her difficulty of respiration was very great. On the fourth day of the disease she miscarried, and as the discharge was greater than she could bear with safety, a smooth piece of ice was introduced into the womb, which brought on a contraction that expelled both my hand and the placenta. The cough and pain were so distressing that she slept none for seven times twenty-four hours, yet the fever came to a regular crisis on the seventeenth day. Here no complaint of the abdominal viscera followed. Three weeks

afterwards, she was taken with an inflammation of the lungs, which required twenty bleedings and a salivation to subdue it. She now enjoys better health than she had done for many years. This case may help to show that it is not the fever of the season falling upon the debilitated abdominal viscera.

There is, however, another argument that may prove more convincing. Four years ago last winter, the synochus was epidemic in this part of the country, and carried off many of the inhabitants. I was living in Philadelphia at the time, but upon inquiry, I do not find that a single woman in child-bed took the disease.

As to the contagiousness of our puerperal fever, I must acknowledge myself in a state of suspense. Never was there a more determined enemy to the doctrine of contagion than myself; yet, in this fever, I resolved from the first, to act on the side of safety.

The last patient had not been exposed to the infection, nor had the midwife or any of the women about her; and I did not go to her, till I had bathed and put on a new suit of clothes, procured for the purpose. Even then I was not five minutes in the room. This case, it is true, ended in pure inflammation, but it is equally true, that it was puerperal fever for the first forty-eight hours, and that the inflammation was super-induced by her imprudent nurses.

As the fever began with the cold weather, I have some hope that it will also cease with it. The last case was certainly the mildest and most manageable. We have heard a confusion of reports, of its being in various parts of the country, but I believe that none of them are to be trusted.

After reading the above, you will not be surprised if I freely acknowledge myself in a state of extreme anxiety. I am not solicitous for my reputation, for I sincerely believe it to be yet secure, as I have now practised four years in this place with complete success in every obstetric case; the woman being able in every instance, except those above detailed, to leave her chamber in three weeks. Even when the midwives had inflamed their patients with the hot regimen, they always found safety in my lancet.

I have no books upon the subject, but your edition of Burns,

Leake, Denman, and White of Manchester, and with these the little that is to be found in practical authors. If you will be so kind as to write a list of such as are useful and can be procured in the city, I will request the bookseller to call upon you for it. I would prefer them in English, but if there are any good treatises in Latin, French or Italian, which I do not expect, I would be glad to have them.

If you think that a more exact account of the disease with the mode of treatment, drawn up with a greater degree of care, would prove any acquisition to the Eclectic Repertory, I will undertake an essay on the subject, after the disease is supposed to have passed over. And I would be the more willing to publish an account of these cases, as a neighbouring physician has made some attempts to prove, that there is no such disease as this I have been describing, and that all these misfortunes were owing to an erroneous practice. Such a man may truly exclaim with Lucretius,

> Suave, mari magno turbantibus aequora ventis,
> E terra magnum alterius spectare laborem,

and yet this very man lost a patient a few days ago in this disease, in twenty-four hours after the chill.

I am your affectionate pupil,
and obedient humble servant,
SAMUEL JACKSON.

Dr. Thomas C. James.

BIOGRAPHICAL SKETCH

OF

EUSEBIO VALLI.

[Translated from the Spanish, and communicated by the Editor of the Port Folio.]

When society is deprived of a valuable member, who has achieved what his genius prompted him to attempt, or who leaves his labours in such a state, that they can be arranged so as to conduce to the beneficial purposes that were contemplated by the author, his tomb may be honoured by tears of admiration and gratitude. But when the benevolent man is arrested in the very moment that humanity is about to be relieved from her sufferings through his skill,—when he falls a victim to the very calamity which he was about to obliterate from the dark catalogue of human woes, we know not where to seek consolation. Throwing aside the balm which resignation infuses into the afflicted mind, we lament the loss of a life so necessary to man! Such are the feelings which are excited by the recent and sudden death of Dr. Eusebio Valli. His fearless philanthropy had led him to a personal inspection of the pestilence in Asia, and he had but lately arrived among us to apply the result of his experience on the disease of our hemisphere.

Ponsaco was not, as Pacdioni thought, the place of his birth; at least, we are assured, by a native of that place, that his name is not to be found in their public registers of baptism of that city. He was probably born in *Mon-feltro*, a small town on the confines of Romania, where his father resided about the year 1778 and practised the art of surgery. We have no account of his literary education, nor of the place where he was initiated in the elements of knowledge. The diploma of a physician, which he received from the College of Pisa, his general acquaintance with the languages, ancient and modern, the marks of distinction which were conferred upon him by learned in-

stitutions, are sufficient testimonials of his acquirements in those branches of knowledge, which treat of the diseases of man and the natural sciences. Iadelot, in a discourse prefixed to the French translation of the Galvanic experiments of Baron Humboldt, asserts that the physician of Pisa discovered animal electricity long before the naturalist of Berlin. About the year 1793, he wrote, in the English language, a treatise on this, until then, unknown phenomenon; and in his own language he subsequently published several essays on the same subject. These were afterwards reprinted by *Brugnatelli*, in the Annals of Chemistry and Natural History, at Pavia. They received further honour by being translated into French and inserted in the Journal of Medicine, Chemistry, and Natural History of Paris. In these writings he proves, from repeated experiments on frogs, that the Galvanic stimulants recommended by Galvani, Volta, and Aldini, are not necessary to excite animal electricity; by touching a muscle or its respective nerve, a motion is excited which may sometimes be perceived 30 minutes after the death of this animal: a result which contributed, perhaps, to the ingenious system of organic life, which has been illustrated, in so admirable a manner, by Dumas, Richerand and other physiologists. From his letter to *Astier* on the anti-putrid and anti-fermentable properties of the red oxyde of mercury and the answer of this professor, it appears that Valli discovered this property in mercury and the latter found it in camphor. If the eulogium which this received from the first Institute in France should not be sufficient to show the knowledge of Valli, we have further evidence in another work, in which he shows himself versed in the doctrine of diseases, physiology and anatomy.

Perfectly master of the auxiliary sciences, Valli confined himself to the disciples of Esculapius and endeavoured to discover the hidden mysteries of his sublime science. Like him he despised mere reptiles and resolved to purge the earth of the monsters by which it was desolated. In pursuit of this laudable design, he travelled through Europe, Asia, and America, exposing himself voluntarily to the most dangerous diseases.

If we except his essays on chronic diseases, all his investiga-

tions were confined to the examination of the acrimony of epidemics in general, hereditary phthisis, the plague and the yellow fever. In the first part of his treatise on phthisis, he establishes various propositions, which if they were not fortified by his great erudition, might be regarded as paradoxical.

Until the year 1794, Europe had been the theatre of his philanthropic exertions; but, as he has himself said, no obstacles can intimidate a mind which is ambitious of an honourable fame, and a heart that cherishes the best feelings of human nature. He went to Smyrna; and waited with impatience for the arrival of the pestilence, which was about to spread dismay among this unhappy people. He watched its progress without being intimidated, and wrote a treatise on the subject, of which it may be no mean praise to state that it was approved by Tissot. Having learned afterwards from *Ingrasias y de Orreo* that when the variolous disease prevailed, the plague ceased; and that as soon as the latter disappeared the former revived; he supposed that the variolous contagion extinguished, or at least, neutralized the plague: from which he inferred that the *virus* would be a preservative against the plague, or that it might soften its malignity. This idea occurred to him in 1785, when he was in Scio* where the plague frequently prevails. Not finding any case of that disease, at the time, he could not make the necessary experiments; but he recommended the subject to the Faculty in that Island and also to those of Smyrna; and gave a variety of rules by which the results of experiments might be obtained with accuracy.

In 1800 Italy was in the possession of the French, and Valli was employed in the army. With the permission of the government, he went to Constantinople where the plague then prevailed. In the month of June he made his first trial on himself. He mixed some variolous matter with the contents of the stomach of a diseased person and inoculated himself with it. For the space of six days he felt the various symptoms of that disease, and his own account of his case, is more interesting to mankind in the opinion of Kalogera than the history of six centuries. He thought he was now safe from this disorder,

* Chios, Island in the Archipelago. What say the Greeks?

but he was again attacked on the thirteenth August with such dreadful and malignant symptoms, that he was astonished when he found himself recovering from it. He was ill 23 days, and after that was so tormented with carbuncles and buboes, that he lost part of the heel of his left foot. When he recovered he continued his experiments; sometimes mixing the *pus* of the plague with the *variolous matter*, sometimes with the gastric juices of animals, sometimes with oil, and he finally vaccinated some persons, being persuaded that he had accomplished what he so ardently wished. The pestilence having ceased at Constantinople, he went to Natolia, where he found the sheep perishing under the ravages of disease. He conceived that this disorder might bear the same analogy to the plague, that the vaccine does to the small pox. But he did not succeed so well in this disease as he expected; for the disease not being contagious, he could not communicate it by inoculation. From Asia he returned to Constantinople and thence passed over into Italy. In 1805 we find him professor of Chemistry and first physician in the Civil Hospital of Mantua, superintending the publication of his histories of the plague, and the various diseases of cattle. The former was dedicated to Prince Ipsilanti and the latter to the reigning Prince of Moldavia; each of whom was worthy to be the Mæcenas of Dr. Valli. The history of the plague is frequently quoted by Bonnisset in his account of the manner of communicating the contagion of the pestilence to men and brutes.

We are not certain how long Valli remained at Mantua; but we learn from a dispatch, without date, from Ragusa to the Minister of the War Department, that having made observations on the yellow fever in that province, he begged to be employed in the army of Dalmatia, in which province a contagious pestilence had appeared among the flocks. It yet remained for this intrepid experimentalist to encounter, near the torrid zone, another monster, as fierce and inexorable as the plague. He was not intimidated either by the immense distance or its inaccessible situation. Having consulted the various works of all who had written on the subject of yellow fever, and compared their observations with his own experience, in Italy and Spain, he determined to go to the *United States*, where this

disease prevails almost every summer,* in order to subject his different hypotheses to new tests, and, if possible, to condense them into an uniform theory.

On the fifteenth of December of the ensuing year the Duke of Feltre, Minister of War, granted him permission of absence for this purpose, and allowed him to retain his rank and pay as a physician of the Military Hospital of Dijon.

When he arrived in Philadelphia, Dr. Moore expostulated with him on the danger to which he was about to expose himself; he answered that he was aware of the hazard, but he was resolved to inoculate himself with the vomit of the dying or the bile of the dead, taking care, however, to mix with it the reactives which he had used on former occasions. If his experiments should cost him his life, he consoled himself in the reward which fame would bestow upon his memory. By a rare fortune this city was preserved from the usual visit of this disease, at the period we mention. He then went to New York and thence embarked for Havanna, where the yellow fever almost always proves fatal to strangers. He arrived on the eighth of September last, and was recommended to his excellency the Captain General and the Intendant of this Island by the Minister from our Court to the United States. The ambassador represented that he was a learned man, who proposed to be useful to mankind at the expense of great personal difficulties; and that after having travelled with that view in Spain, France, England, and Germany, he went to Constantinople and inoculated himself with the plague in order to observe, on himself, its symptoms and effects: that, desirous of becoming acquainted with the yellow fever in the same manner, he had come from Europe to the United States; not finding the disease he proposed to seek it in this island. His excellency added that he merited every assistance which might enable him to perform a service so important to humanity.

On his arrival, he presented himself to the Tribunal of the

* This expression requires to be qualified. Though we lament the ravages committed by the yellow fever in different seasons, this city has now experienced an exemption from that scourge for the last twelve years.—EDITORS.

Proto Medicato, explained the object of his visit and begged that two of the faculty might be permitted to accompany him, and witness his experiments. He flattered himself, he said, that he could communicate to them observations on the disease of the island, which might be of use. Dr. Antonio Machado and myself were honoured with this appointment. On the twentieth of the same month, Dr. Valli went to the hospital of St. Juan de Dios, accompanied by Dr. Antonio Mendoza, in search of a case upon which he might commence his experiments. He found but one, and in that, the patient was so ill that he was thought to be breathing his last. Valli observed him with surprise; black, corrupted blood was issuing from his mouth, and other parts of his body exhibited the cadaverous appearance of death. He felt his pulse. A profuse, cold perspiration congealed his hand. The intrepid physician who had braved death so often, was appalled! He retired in order to bathe himself with vinegar. The dread was but momentary. Benevolence to mankind prevailed over fear, he returned to the hospital on the ensuing day—sought the patient—and found him in his coffin! Pliny the naturalist was devoured by the fire of Vesuvius whilst he was exploring its causes:—Lippi, the botanist, was assassinated by the barbarians of Abyssinia: —Bichat, the anatomist, imbibed the germ of a disease which brought him to a premature grave, in the amphitheatre of Paris; and Valli, whose enthusiasm was by no means inferior to these instances, carried from the hospital the seeds of a deadly poison. He retired to his lodgings, declaring that he felt the disease. This was, soon after, evident, and he seemed to be convinced that he should not recover. Pale, feeble and almost lifeless, he could scarcely be heard: "my destiny," said the martyr to zeal—"is irrevocable. I am dying." In vain were all the efforts of skill to save him! He died on the third day, in the 51st year of his age; and thus terminated a life which might have produced the most salutary effects, if it had been prolonged.

THIS STONE

Is consecrated, by the Economical Society of Havanna, to the memory of Dr. Eusebio Valli, who fell a victim to his love of mankind, A. D. 1816.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

Report of the City of London Truss Society, for the Relief of the Ruptured Poor, throughout the Kingdom, Grocers'-hall Court, Poultry.—From the most accurate estimation, it appears, that this malady exists in one person in eight through the whole male population of this kingdom, and in a much greater proportion among the labouring classes of the community, in manufacturing districts, particularly in those persons who are employed in weaving, or on the water as boatmen.

In one district in the western part of England, comprising 200,000 inhabitants, it has been ascertained, by actual observation, that upwards of one in five of the whole population labour under this malady.

Patients relieved by this Society in	1808	227
	1809	570
	1810	813
	1811	1094
	1812	1666
	1813	1800
	1814	2064
	1815	2473
	1816	2610
		13,317

The following statement of the situation and occurrence of hernia, at different periods of life, has been extracted from the register of the patients relieved by the City of London Truss Society, within the short period of nine years.

In 12,282 cases, 10,121 were males, and 2161 were females.

Males	Females			
2050	40	left inguinal	5761 inguinal	6621 single.
3629	42	right inguinal		
68	359	left femoral	860 femoral	
76	357	right femoral		
3951	31	double inguinal		4286 double.
61	243	double femoral		
45	472	umbilical		603
24	62	ventral		
	1	perineal		1
	2	obturator		2
18	30	have undergone operations, all except *one* have been completely successful		48
110	111	with umbilical and inguinal hernia have been cured		221
84	19	with prolapsus ani		103
	390	with prolapsus uteri		390
5	2	with varix of the abdominal veins		7
10121	2161	12282		12282

875	patients were relieved with trusses under 10 years of age.		
609	ditto, between	10 and 20	ditto.
1219	ditto,	20 and 30	ditto.
2032	ditto,	30 and 40	ditto.
2165	ditto,	40 and 50	ditto.
2160	ditto,	50 and 60	ditto.
1522	ditto,	60 and 70	ditto.
509	ditto,	70 and 80	ditto.
67	ditto,	80 and 90	ditto.
4	ditto,	90 and 100	ditto.
11162			

Six females each had umbilical and double femoral hernia, 2 females had large ventral and double femoral hernia, 5 females had umbilical and ventral hernia, 1 female had ventral and prolapsus uteri, 6 females had umbilical and single femoral hernia, 4 females had right inguinal congenital hernia, 7 fe-

males had left inguinal and right femoral hernia, 1 female had left femoral and right obturator hernia, 4 females had ventral and single femoral hernia, 1 female had double femoral and right inguinal hernia, 6 females had double inguinal and umbilical hernia, 1 female had right inguinal and ventral hernia, 7 females had left inguinal and left femoral hernia.

Twenty-six males each had left femoral and right inguinal hernia, 8 males had left inguinal and left femoral hernia, 21 males had left inguinal and right femoral hernia, 9 males had double inguinal and right femoral hernia, 6 males had double inguinal and left femoral hernia, 4 males had right inguinal and right femoral hernia, 2 males each had double inguinal and double femoral hernia, 6 males had double femoral and right inguinal hernia, 3 males had ventral and right inguinal hernia, 1 male had ventral and right femoral hernia, 2 males had ventral and left inguinal hernia, 1 male had ventral and double inguinal hernia, 1 male had left inguinal, umbilical, and ventral hernia, 1 male had umbilical and left inguinal hernia, 1 male had umbilical and left femoral hernia, 1 male had umbilical and right femoral hernia, 8 males each had umbilical and double inguinal hernia, 2 males had double femoral and right inguinal hernia; 627 patients had congenital hernia, 5 males had very large varicose veins on the abdomen.—*Lond. Med. and Phys. Jour. for March*, 1817.

METEOROLOGICAL OBSERVATIONS.

State of the weather at Philadelphia during the first six months of 1817.

January.

Thermometer—Lowest, at 8 A. M. 19. 20th and 23d days of the month.
Highest, at 3 P. M. 51. 7th.
Mean, ... 30.

The weather uncommonly mild until the 12th—on the 19th the river was frozen at Reedy Island.

FEBRUARY.

Thermometer—Lowest, at 8 A. M. 4. 15th of the month.
Highest, at 3 P. M. 50. 22d.
Mean, ... 25.

Winds—westerly. Heavy snows—which continued on the ground. The winter severe after it commenced in January—as rigorous as it had been known for forty years. A severe storm in Great Britain on the 15th.

MARCH.

Thermometer—Lowest, at 8 A. M. 28. 3d of the month.
Highest, at 3 P. M. 60. 22d.
Mean, ... 35.

Winds—chiefly westerly. The ice in the river gave way on the 10th. Pleasant month—little rain. Spring very early in Europe.

APRIL.

Thermometer—Lowest, at 8 A. M. 40. 19th of the month.
Highest, at 3 P. M. 80. 16th.
Mean, ... 50.

Winds—westerly—a very dry season. The locusts, after an absence of seventeen years, now appear in abundance. The ice islands were met with in the Atlantic, the beginning of the month.

MAY.

Thermometer—Lowest, at 8 A. M. 50. 30th of the month.
Highest, at 3 P. M. 79. 26th.
Mean, ... 60.

Winds—varying between north-east and north-west. Weather pleasant. Ice in the St. Lawrence at Quebec, broke up on the third of the month.—A severe shock of an earthquake on the 22d, in New England and Nova Scotia.

JUNE.

Thermometer—Lowest, at 8 A. M. 55. 3d of the month.
Highest, at 3 P. M. 85. 14th.
Mean, ... 70.

Westerly winds prevailed. A pleasant month—much refreshing rain with thunder—a severe storm with high wind and hail on the 21st. A very brilliant Meteor was seen on the 24th, about ten o'clock at night, at Philadelphia and New York—its passage was from south to north. Much damage done to the wheat by the Hessian fly in some parts of Maryland and Virginia—and the young indian corn greatly injured in many parts of the United States by a worm—vegetables fine and abundant—and in general very favourable prospects of the grain harvest. In March and April an unusual number of remittent fevers, which generally assumed the typhous character—some small pox continues—no measles—yellow fever prevalent at Havanna in the month of June.

PENNSYLVANIA HOSPITAL.

Patients remaining in the house, April 27, 1816.		188	
Admitted from that time to April 26, 1817.		684	
			872
Of these the number Cured is,	414		
Relieved,	87		
Removed,	71		
Infants born,	11		
Eloped, &c.	38		
Dead,	70		
Remain,	181		
		872	
Out patients,			
Cured,	1669		
Relieved,	60		
Disorderly,	12		
Died,	63		
Removed to Hospital and Alms House,	36		
Result unknown,	20		
Remained April 26, 1817,	49		
		1909	

College of Physicians of Philadelphia.

JULY 1, 1817.

Officers of the College elected:—

President.
Doctor Adam Kuhn.

Vice President.
Doctor Thomas Parke.

Censors.
Doctor Caspar Wistar,
William Currie,
Samuel P. Griffitts,
Thomas T. Hewson.

Treasurer.
Doctor Thomas C. James.

Secretary.
Doctor Joseph Parrish.

Obituary.

Died in Philadelphia on the seventh day of April, 1817, Doctor JOSEPH WOOLLENS, aged thirty-four years.

—— on the fifth day of July, 1817, Doctor ADAM KUHN, aged seventy-six years.

THE

ECLECTIC REPERTORY

AND

ANALYTICAL REVIEW.

Vol. VII. OCTOBER, 1817. No. IV.

SELECTED PAPERS.

On the Temperature of the Summers which are adapted to give activity to the infection or seeds of the Yellow Fever, in the city of Philadelphia.

[From the American Daily Advertiser.]

ON the first day of August 1809, there was published in the American Daily Advertiser, and, on the same day or within a few days after, in most of the other daily papers of this city, an account, which I had prepared, of the state of Fahrenheit's thermometer taken in the shade at 3 P. M. during seventeen summers, 1793 to 1809, both inclusive. I shall now republish that account, and subjoin a state of the same instrument from 1810 to 1817, so as to comprehend in all twenty-five summers, 1793 to 1817. The intent of this publication is to exhibit to public view the mean heat at 3 P. M. of each and every of those summer months, and to draw an inference from thence, that the *Yellow Fever*, being a native of hot climates, cannot probably prevail to any alarming extent here in any season, except the mean heat of the thermometer at that hour, during the summer, and especially during the two whole months of June and July, shall be as high as seventy-nine degrees—if cooler, it will not spread, al-

though some passengers and their clothing and bedding may arrive here, bringing the disease or the infection with them; but in hotter seasons it has prevailed and probably will again prevail more or less, and very much in proportion to the heat of the season.

This is not an enquiry prompted by idle curiosity, but an attempt to establish a knowledge very important in its consequences, not only to all our citizens concerned in naval or mercantile business, but to the whole population of this city and liberties; because, if well founded, as I believe it to be, it will serve as a rule to point out to every citizen when there is, or is not, danger to be apprehended; when it may be necessary, or not, to provide retreats in the country. If well understood and established to be a truth founded in experience, it may also tend to disembarrass the trade of this port, in some years, from detentions and quarantines when they are useless.

By the following account of the mean heat at 3 P. M. of each month in the last twenty-five summers, it will appear evidently that the *Yellow Fever* has never within that period prevailed here at all, or so as to occasion alarm, when the mean heat at that hour of all June and July had been lower than 79°, only a very little in 1802; and that in every summer when it has been above 79° it has prevailed more or less, and the mortality has been regulated very much by the heat being higher or lower. In 1793 and 1798, which were the hottest summers in all the twenty-five years, it prevailed most, and was attended by the most extreme mortality. In 1797, 1799, 1803 and 1805, when lower degrees of heat prevailed, the mortality was less. In all the other years (except a small mortality in 1802) when the mean heat of those two months was below 79° at the hour mentioned, we have had no alarm of *Yellow Fever*.

I consider the two months of June and July as governing the summer season, insomuch that by the first day of August in any year, we may be pretty certain whether we shall be afflicted with *Yellow Fever* that year, or not; so that if we find the mean heat of the thermometer at 3 P. M. placed properly in the shade, in a free current of air, at least 20 or 30 feet from any sunshine, and not exposed to the reflected heat of

any building, to be below 79°, we may rest easy, and conclude that we are not likely to be visited with that scourge during the summer or autumn then passing over our heads.

In 1793 the mean heat of June and July at 3 P. M. was 82°—in 1798 it was 80° 6, both of which indicated the calamity that followed; but August 1798 was so extremely hot, that it heightened the mortality and made it nearly equal to what it was in 1793, when the two first summer months were hotter, but August not so hot as in 1798. The wetness or dryness of the summer may also have an effect, not yet well ascertained; it being remarkable that in 1805 when the mean heat of all June and July was 79° and Aug. 81° 7, the two months of July and Aug. were so very dry, that perhaps not so much as one quarter of an inch in depth of rain fell till within 3 or 4 days of the end of the latter month, when it rained moderately; this rain appeared to be sufficient, coming after the preceding heat, to give activity to the dormant infection of the *Yellow Fever*, which immediately afterwards broke out, more especially in Southwark, where it was very mortal in all September. The use of the Schuylkill water, which is said to be much purer than the old pump water, may have had a beneficial effect by way of prevention within the last ten or twelve years; so may the regulations and care of the different boards of health, which to a certain degree should never be intermitted: still I am of opinion that the heat, not of a few days or weeks, but the mean heat of the summer season, is the grand governing cause, under Providence, that excites or depresses this alarming and dreadful scourge when it appears in our city.

Here follows the state of the Thermometer in each month of those twenty-five Summers as above referred to.

YEAR.	Mean Heat of June at 3 P. M.	Mean Heat of July at 3 P. M.	Average of the two months of June & July at 3 P. M.	Mean Heat of August at 3 P. M.	Mean Heat of the whole three Summer months at 3 P. M.	REMARKS. Note.—The *Yellow Fever* years are marked with an Asterism.
**1793	79 7	84 3	82	82 7	82 2	Great mortality of yellow fever in Philadelphia—4000 died in August, September and October.
1794	75 6	80 4	78	81 7	79 2	No alarm of yellow fever here.
1795	75	82 2	78 6	80 3	79 2	Ditto—fever in New York and Norfolk.
1796	76 5	81 5	79	80 3	79 4	No alarm here.
*1797	79	84 2	81 6	79	80 7	Yellow Fever here—1250 died in three months.
**1798	77	82	79 5	86 5	81 8	Great yellow fever here—3500 died in 3 months.
*1799	77	84	80 5	82	81	Yellow fever here—1000 died in three months.
1800	75	78	76 5	78	77	No alarm here—fever in Baltimore.
1801	76	80	78	77	77 7	No alarm here.
*1802	75 7	78	76 3	78	77 2	Yellow fever spread a little—perhaps 200 adults died of it.
*1803	76 9	81 8	79 3	79 4	79 3	Yellow fever here—slightly.
1804	71	78	74 5	75	74 7	No alarm here.
*1805	75	83	79	81	79 7	Yellow fever began about the 1st of Sept. was very mortal in Southwark and little out of it.
1806	78 1	78 7	78 4	72 1	76 3	All these twelve years were cooler than 79°, on a mean of all June and July at 3 P. M. and there was no alarm of yellow fever in Philadelphia, in any one of them, I believe, or none that spread and continued.
1807	71 6	77 9	74 7	75 2	74 9	
1808	75 5	78 8	77 1	76 5	76 9	
1809	73 7	75 1	74 4	76 7	75 1	
1810	74 2	75 4	74 8	75 4	75	
1811	74 4	80 1	77 2	75 3	76 6	
1812	73 8	77 4	75 6	74 2	75 1	
1813	75 3	76 7	76	77 3	76 4	
1814	70 1	73 2	72 6	76 7	74	
1815	74 2	81 8	78	77 3	77 7	
1816	72 5	73 5	73	76 5	74 1	
1817	73 2	78	75 6	77 3	76 3	

The state of the thermometer as above noted has been taken, 1793 to 1799, from the observations of David Rittenhouse, Esq. deceased, or some of his family, made at his place of residence, corner of Delaware Seventh and Mulberry streets, for the next fifteen years chiefly by Dr. Saml. Duffield, deceased, in Chesnut near Front street, in a northern exposure, and since by myself in Delaware Eighth street, with an easterly exposure—All I believe tolerably correct.—Any man may keep such an account for himself, and a thermometer of the price of five or six dollars will answer the same purpose as a more expensive instrument.

Sept. 9, 1817. C. E.

Vauquelin's Analysis of the Ergot of Rye.

[From the London Medical Repository, for April 1817.]

The *Ergot* having lately attracted much attention, *M. Vauquelin* was induced to undertake its analysis, and has published the result of his experiments*. As this is a subject of considerable interest, we present our readers with a translation of M. Vauquelin's Paper, which is entitled, *Analyse du Seigle Ergoté du bois de Boulogne, pres Paris.*

"M. Desfontaines, who was charged by the Academy of Sciences with the examination of a Notice by M. Virey, relative to the ergot of rye, having engaged me to submit the ergot to chemical analysis, I embraced this task with more willingness, as the object is of the utmost importance, as far as the health both of men and of the lower animals is concerned. Many distinguished chemists, particularly M. M. Bucquet and Cornet, (see *Treatise on the Diseases of Grain*, by M. Tessier,) have analysed the ergot of rye, and I acknowledge that they have nearly exhausted the subject; but as the same causes do not always operate in the production of ergot, I consider it a duty to publish what I have done, with the hope of awakening the attention of Naturalists and Chemists.

"*Physical properties of the Ergot.*—The *colour* is externally violet, and internally white. Its *figure* is cylindrical, the extremities being more or less tapering, and curved in form of a crescent, having a furrow on the convex as well as the concave side. It has at first no smell, but after some time acquires one which is acrid and disagreeable. A grain cut transversely and viewed under the microscope, appears composed of white brilliant grains resembling those of starch. The coloured pellicle which constitutes its exterior tunic, presents, when examined by the microscope in a similar manner, a violet-coloured mass with minute whitish specks scattered through it.

"*Experiments with different agents, with a view of ascer-*

* Vide *Annales de Chimie et de Physique*, tome iii. p. 337.

taining the best solvents of the colouring principle of ergot.—Several entire grains being put into a phial with alcohol did not sensibly colour it; but a quantity of the bruised seeds being treated with boiling alcohol, coloured the spirit a brownish red with a shade of violet.

"Water boiled in the same seeds acquired a beautiful violet red hue, less intense than that of the alcohol. Water alkalised by subcarbonate of potash, and cold, acquired a deep wine red hue, but the colour became more intense on the application of heat. Water acidulated by acetic acid was not remarkably coloured, even when heated; that by sulphuric acid acquired a pale red tinge; that by muriatic acid a similar but deeper hue; and that by tartaric acid a very pale rose colour; while by nitric acid it became yellow, the colour being destroyed.

"Water and alcohol, therefore, appear to be the true solvents of the colouring principles of ergot; but water possesses this property in the highest degree.

Effects of Re-agents on the different Solutions.

"The *Aqueous Solution* reddened litmus paper, precipitated acetate of lead lilac, and lime water light blue, whilst the supernatant fluid remained green. Acetate of iron threw down a blueish grey precipitate. The solution made with the *alkalized water* was precipitated lilac by acetate of lead, and purplish red by vinegar: the supernatant fluid remaining rose-coloured.

"*Experiments.*—1°. Two ounces of bruised ergot of rye were treated with boiling water, until it ceased to take up any colour; and the residue then treated with alcohol, which was boiled upon it. This alcoholic decoction, which was of a yellowish red colour, was then put into a retort, and distilled, in order to separate the alcohol, and procure the matter which it had taken up. The extract thus obtained, which was of a greenish brown colour, and had an acrid bitter taste, reddened the tincture of litmus, and swelled up when put upon live coals, emitting the odour of burnt bread.

"The aqueous decoction was rendered turbid by chlorine and galls; when evaporated, it yielded a brownish red extract,

of a taste at first sweet but afterwards bitter and nauseous. This extract reddened strongly litmus paper; but when bruised in a mortar with potash, it disengages a very fœtid odour of ammonia. The ergot, after having been thus treated with water and alcohol, was divided into several parcels; one of which, treated with subcarbonate of soda, only faintly coloured that alkali; the other, introduced into a small coated glass retort, yielded, on distillation, an oily product, of the consistence of butter. Paper reddened by an acid, and plunged into the air of the receiver, which contained the product, was restored to its natural colour: water agitated with this oil was a little coloured, acquired a slight degree of acidity and a bitter acrid taste; and when mixed with potash, it disengaged ammonia. The charcoal which remained in the retort, left, after its combustion, which was very difficult, a grey cinder, chiefly composed of phosphate of lime and magnesia, in combination with a little iron.

"2°. Twenty grains of bruised ergot, distilled on a slow fire, with four ounces of water, furnished a liquid slightly alkaline; for it changed to blue, litmus paper reddened by an acid; to green the syrup of violets; and formed precipitates with solutions of acetate of lead and of nitrate of mercury.

"3°. A certain quantity of the bruised seeds were washed on a silk sieve, to ascertain whether they contained starch; but a coloured matter only was obtained, which had none of the properties of starch. The water of the washings, being kept in a well corked flask, after some days disengaged an odour of ammonia mixed with that of putrid fish.

"4°. As the matter soluble in alcohol, obtained in the first experiment, had been mixed with the matter soluble in water, the operation was re-commenced in order to separate the pure resinous part. Twenty grammes* of the ergot were treated with alcohol at 40°, until it ceased to colour it. On evaporating the solution, a blueish red substance was procured, which had an acrid taste, and afterwards an oil resembling rancid fish-oil. The alcohol, which came over in distillation, emitted an insupportable odour of bilge water. The extract placed

* 310 Grains.

upon ardent coals, exhaled in burning the smell of volatilized fat. After having been thus exhausted by the alcohol the residue was boiled with water, which was coloured by it of a very beautiful violet red, and extracted a white oil that floated on its surface. This oil had no remarkable smell or taste. The colouring matter which was dissolved in the water, was reddened by the acid.

"5°. Forty grammes of bruised ergot of rye were distilled in a coated glass retort, to the neck of which a phial was adapted as a receiver. A gentle heat only was kept up for three quarters of an hour, after which it was augmented so as to redden the bottom of the retort. A large quantity of a thick disagreeable smelling oil came over. Litmus paper reddened by an acid, and plunged into the air of the receiver, was restored to its blue colour: and water, poured upon the oil to dissolve the fluid ammoniacal portion of it, became soft to the touch, and had all the appearance of a concentrated solution of soap; and, which was more remarkable, it was strongly alkaline, like the water which washed the oil procured from the ergot exhausted by water and alcohol; and distilled, was slightly acid. The charcoal which remained in the retort was very light; it weighed 7.700, so that the 40 grammes of the matter employed had lost 32.300.

"6°. Wishing to determine whether the ergot of rye, deprived of its colouring matter by water and alcohol, would yield a red colour to muriatic acid, a portion of it well bruised was put into this acid in a concentrated state. No remarkable action was at first perceptible; but in the space of twenty-four hours the acid had acquired a brownish-red colour.

"*Application of the colour of the Ergot to wool and silk.*—With the view of ascertaining whether this colour, which appeared to me analogous to that of orchil, could be applied as a dying material, I prepared some wool and silk; and after having allowed them to steep for twenty-four hours in a cold solution of alum, containing an eighth of cream of tartar, I plunged them into an infusion of ergot, heated to 60° (centig.): they took the colour well, and in a short time both substances were saturated with a yellowish-red colour, although the bath was purple; but the wool was deeper tinged

than the silk. This yellowish red hue seemed to depend on the cream of tartar; for some of the silk prepared with alum alone acquired in the same bath a lilac colour.

"The colour which wool and silk takes in the infusion of ergot, previously treated with alcohol, is a much purer violet; because the spirit takes up a yellow matter of an oily or resinous nature, which also attaches itself to these substances.

"Ergot, therefore, contains two colouring principles; one soluble in alcohol, of a resinous nature, and which impresses a reddish yellow tint; the other much less soluble in alcohol, but soluble in water, and which is violet like the juice of orchil, but differs from it in its little solubility in alcohol.

"I found, on endeavouring to discover how this colour is developed in ergot, that a colour of a similar shade may be obtained from the farina of wheat by dissolving it in concentrated muriatic acid; the colour developing itself as the solution of the flour proceeds until it is of a deep violet; but, after some hours, it passes to a purple, and continues so at least for several days. This solution does not become turbid, nor change its hue, on being diluted with water, but merely diminished in intensity, like any other colour. After some time, a light oily pellicle appears upon the surface of the diluted solution, similar to what is seen upon an infusion of the ergot when it it heated.

"It is probable, that this oily matter is not the consequence of the action of the muriatic acid upon the flour; for I have detected it in flour by means of alcohol. Conceiving it would be interesting to know, were it possible, to which of the elements of the flour the colouring matter was due, I dissolved one part of pure starch in muriatic acid; but no colour was developed. I then dissolved fresh gluten in muriatic acid, and obtained a blueish-grey colour. Observing that the two colouring principles which flour contained did not furnish the colour when separated, which they yielded when united in the flour, I began to prepare the mucoso saccharine principle which completes the composition of the flour, but when about to mix the acid solution of the gluten with that of the starch, I perceived almost instantaneously formed the beautiful colour of which I have spoken. I imagined that the colour

would have exactly resembled that of ergot, and this idea seemed the more probable, as I knew that gluten produced a violet colour during its decomposition in water*: but the following experiments changed my opinion; 1°. Alkalies poured in excess into the muriatic solution of wheat, changed this purple into a yellow, and it could not be again completely restored by the acids. I could not detect any disengagement of volatile alkali in thus saturating this solution. The colour of ergot is not sensibly changed by the alkalies; which only make it incline a little more to purple. 2°. This colour diluted with water alkalized to weaken the acid, is not fixed upon either wool or silk, like that of the ergot. We must therefore conclude, that the colour developed in wheat flour by means of muriatic acid, is not the same as that of ergot; and thence we can draw no conclusion from these experiments regarding the presence of gluten and starch in ergot. Yet if there exists no true gluten in ergot, it contains an azotised substance, since the action of heat upon it produces a considerable quantity of ammonia. It is even probable that it contains starch; but in a peculiar state of combination. The farina of rye, mixed with concentrated muriatic acid, coloured it first yellow and then red, similar to what occurs in the same acid with ergot which has been washed in water and alcohol.

"I made several experiments with starch and gluten in the muriatic acid, and observed, that the solution with starch may be diluted with water without affording any precipitation or losing its transparency; while that of the gluten is instantly precipitated in greyish flocculi, and the supernatant liquor remains of a blueish hue. I do not yet know whether gluten suffers any change of composition during its solution in muriatic acid; nor am I aware how a purple tint so beautiful and intense, is developed by the contact of flour and muriatic acid. Is it the effect of simple combination, or the product of decomposition? My time does not permit me to make the researches requisite for resolving these interesting questions.

"From the above experiments we may conclude that ergot contains—1°. A fawn-yellow colouring matter, soluble in al-

* Vide *Annales du Muséum*, vol. vii. p. 1.

cohol, and having a taste resembling that of fish-oil; 2°. a white oily matter, of a sweetish taste, which appears to be very abundant in the ergot; and is the same which M. Cornette obtained from it by simple pressure: 3°. a violet colouring principle, of the same shade as that of orchil, but differing from it by its solubility in alcohol, and which can be readily fixed on aluminated wool and silk: 4°. a free acid, of which I have not yet determined the species, but which I believe to be partly phosphoric, if we may be allowed to decide from its fixedness, and the precipitates which ergot forms with lime water, barytes water, and acetate of lead: 5°. a very abundant vegeto-animal substance, much disposed to putrefaction, and which furnishes a considerable quantity of thick oil and of ammonia by distillation: 6°. a small quantity of free ammonia, which can be obtained at the temperature of boiling water.

"After these chemical proofs to which we have submitted ergot, can we pronounce with certainty on the nature of that production? Is it a new vegetable which is formed in the bark which ought to contain the grain of the rye, as Decandolle supposes? or is it only a disease of the grain, produced by external causes, as has been hitherto generally believed? If, for the admission of this latter opinion, it be required that the same principles be found in the ergot as in the natural grains of rye, the opinion must be given up; as scarcely any starch, which the rye contains in great abundance, can be detected in it. Neither can gluten be separated from it, at least in its natural state; but there exists in it, as in healthy rye, a substance which, on being decomposed by heat, furnishes, like starch, an acid; and another which supplies ammonia, like gluten. If the physical properties also of ergot be examined, we shall be more inclined to regard it a disease of the grain: as it preserves, to a certain degree, its original form, and the remains of the furrow, which characterize the seeds of the cerealia. In the interior also the ergot presents a structure formed of white shining grains, like that of the natural rye.

"It would appear, then, that in this disease the rye chiefly suffers in its amylaceous principle; since scarcely any trace of it is to be found in the ergot, and the starch is replaced by a

mucous matter. The gluten is not in its natural state; but has suffered a change, which has modified its properties, and given birth to a thick oil and ammonia. Finally, I think we may regard the ergot of rye as the effect of putridity: and it is probable that it is the acrid matter, and the putrescent animal substance contained in the ergot, which produce the poisonous effect it has on the animal economy."

This paper is followed by a similar analysis of the Sclerotium *steriorum;* from which the following conclusions are drawn:

"1°. This species of Sclerotium differs from the ergot of rye in its infusion, being colourless and devoid of acidity; it is also precipitated more copiously by alcohol, galls, and chlorine; it is much more mucilaginous than that of the ergot; the watery extract has no acrid, disagreeable taste, like that of the ergot; on the contrary, it is sweet and mucilaginous, like that of mushrooms.

"2°. Submitted to distillation in a glass vessel, it does not yield as large a quantity of buteraceous oil as the ergot; the air of the receiver is alkaline like that of the ergot; but the product is more fluid and acid.

"3°. The ergot contains a fixed oil, which is not found in the sclerotium: it also contains exclusively a species of very acrid resin. Finally, ergot contains ready-formed ammonia, which may be procured at the temperature of boiling water; the sclerotium yields it only at a red heat. Such are the essential differences in the composition of these two productions."

Scarpa's Improved Operation for Aneurism.

[From the London Medical and Physical Journal, for May 1817.]

I BEG leave to transmit to you, for the information of your readers, a communication received in a letter from Professor Scarpa, dated March 30th, the object of which is the improvement of Mr. Hunter's Operation for Aneurism.

I am, Sir,

30, *Edgeware Road,* Your obedient servant,

April 18. JAMES BRIGGS.

"During the last year, I have made many experiments on animals after the manner of Jones, in order to determine the most useful method of tying the large arteries of the limbs. From these experiments I have drawn several useful results, which I shall shortly publish; but one of them has particularly arrested my attention, viz. that, on the fourth day from the operation, the ligature may be safely removed from the artery, as the cohesion and closure of the vessel is then sufficiently strong to resist the impetus of the blood; and, consequently, that it is not necessary, as is usual, to wait until the ulcerative process has loosened the ligature from the artery. From sixteen to twenty days of valuable time is thus lost, during its detachment, which might be much more advantageously employed in the treatment of the wound, freed from every extraneous body, and disposed to heal by the first intention.

"The first trial was made on a man, on account of a popliteal aneurism, three months ago. The ligature was removed from the femoral artery on the fourth day after the operation; and the result perfectly answered my expectation, the pulsation in the aneurism being no longer renewed. As soon as I have collected a sufficient number of facts similar to this, I design to give a full detailed account of them. I find, in performing the operation in this manner, that a small compress [cylinder] of cloth, imbued with ointment, interposed between the artery and ligature, is of great utility, and, indeed, indispensable, in rendering the removal of the ligature easy; whereas, when applied singly round the vessel, it is so imbedded between the internal and middle ruptured coats, as to make the division of it unusually difficult and dangerous. By this method, on the contrary, it may be readily and safely divided upon the compress.

Pavia, March 30, 1817."

We expect further information from this truly illustrious professor; but may, at present, be permitted to remark (as we did concerning the silken ligatures proposed by some English surgeons) that, after Mr. Hunter's operation for aneurism, and after a successful amputation on Mr. Allison's method,

we have often seen complete union by the first intent, excepting where it was interrupted by the ligatures, the ends of which were permitted to hang out till the parts attached to the arteries were, in a few days, so loosened by suppuration as to be removed without violence.

On a new Species of Resin from India. By J. F. DANIELL, Esq. F.R.S. M.R.I.

[From the Journal of Science and the Arts, for March 1817.]

THE resinous substance, the properties of which I shall endeavour to describe, was sent to me for examination by my friend Mr. H. B. Ker. Its history is this.—A lady brought from India a work-box that had been varnished: the varnish looked particularly clear, and had borne the heat of the climate without cracking or changing colour. Some distinguished artists saw it, and admired its peculiar beauty. The lady sent to the Rajah from whom she had originally procured it, and he remitted her an hamper full of stone bottles, containing the varnish, informing her that it was employed in all his ornamental work, and that it was used just as it was extracted from the tree from which it was procured, by incision. The name of the tree he unfortunately omitted to send. Its original consistence is that of cream, and when spread upon white paper, it dries quickly, is colourless, and of a brilliant polish, never cracking when exposed to the sun. The specimens which were sent over were put into the bottles upon being collected, and the precaution was taken of filling their necks with water. Notwithstanding this, their contents had become perfectly solid. In the state in which I received it the resin was opake, except just at the exterior coat, which was slightly translucent, of a very pale green colour, conchoidal fracture, and of a lustre intermediate between resin and wax. It was tasteless, easily pulverized, and inodorous. It inflamed with violence, and deposited much carbonaceous matter whilst burning, and diffused a pleasant aromatic smell. Its specific gravity was 1033.

Two hundred grains of it pulverized were boiled for three hours in half a pint of distilled water: it was then allowed to stand for twelve hours. The resin, on being collected and dried, had lost in weight only 0.8 of a grain. The infusion was reduced by evaporation, and it then presented the following properties. Muriate of tin threw down a dark brown powder; solution of chlorine in water produced a yellow precipitate; and muriate of alumina, when boiled with it, became cloudy. These are the indications of extractive matter.

It was then subjected to the action of cold alcohol. Much of it was dissolved, but an insoluble white powder remained, and did not decrease in quantity by boiling.

The same white substance was left when the resin was acted upon by ether and spirits of turpentine. It was collected upon a filter well washed with alcohol, dried at a gentle heat, and then weighed 75 grains.

The alcoholic solution was colourless, and had a very peculiar smell, resembling that of the bruised stalks of green vegetables: water instantly precipitated the resin. It was evaporated at a very gentle heat, and a light yellow transparent resin remained, which weighed 127 grains. The same resin was collected from the ethereal solution.

The undissolved residue was inflammable and burned with much smoke and a pleasant smell. It possessed no elasticity to the touch, but felt like powdered starch. It was not affected by any temperature under 360° of Fahrenheit's scale, when it began to fuse and melted by a continuation of the heat into a deep-brown transparent resin. The resin which had been dissolved by alcohol began to soften at 100°, and the original resin at 220°. The specific gravity of the most fusible was 932; of the least fusible 100.

From these experiments it appeared probable, that the peculiar good properties of this resin, as a varnish, arose from the resistance of the latter ingredient to the action of heat and chemical menstrua, and that in nature the most fusible resin was the solvent of the least fusible. I was the more anxious to find out some means of again combining the two in the fluid state, as I had little doubt but that the compound might prove an useful acquisition to the arts.

Acetic acid acted upon the resin in the same way as spirits of wine, turpentine, and ether: it dissolved one portion and left the other. Fifty grains of the natural resin and of the two separate resins were boiled in nitric acid. The action upon the most fusible was very violent. Nitrous gas was given off, and it was first converted into a deep orange-coloured substance, and then dissolved. The other two required longer digestion and a stronger acid, but were finally dissolved, after having been converted to a deep orange colour. Water added to the solutions produced a yellow precipitate, very bitter to the taste, and inflammable. Lime water produced no change, proving that no oxalic acid had been formed; but acetate of lead threw down a copious precipitate of malate of lead. It is remarkable, that the nitric solution, upon standing for some days, emitted a very strong smell of apples. It produced a slight cloud in solution of isinglass.

Solutions of the alkalies dissolved the most fusible resin copiously, the least fusible sparingly. They were precipitated by muriatic acid, and re-dissolved by excess.

Olive oil combined with the natural resin; but the compound was opake. When previously melted, it united with linseed oil, forming a drying varnish, but of a deep yellow colour. When subjected to distillation, a thick oil came over, possessing a strong empyreumatic colour. It was taken up by alcohol, from which it was again precipitated by the affusion of water. A small quantity of carbon was left in the retort.

From these experiments it appears, that the least fusible resin approaches in its characters to copal, differing, however, from it, in being insoluble in ether.

After many fruitless trials, I at length succeeded in effecting the solution of the resins, either combined or separate, by the following process. Equal parts of camphorated spirits of wine and oil of turpentine were put into a flask, and about an eighth part of ammonia added to them. The resin was then put in, in fine powder, and the whole boiled together. The turpentine does not unite with the spirits of wine; but from the agitation of boiling, they become intimately blended, and thus mixed, they act upon the resin and dissolve it completely. The addition of ammonia to either spirits of wine or

turpentine separately, is not sufficient for this purpose. Upon being allowed to stand at rest for some time, the liquid separates into two portions. The lower is transparent and brown, the upper opake; but in the course of a few days likewise becomes clear, and is nearly devoid of colour. It has a slight tinge of green, and when spread upon white paper, it quickly dries, and forms a remarkably tough and glossy varnish. Its specific gravity shows that it is chiefly composed of the spirits of wine; it retains, however, a strong smell of the turpentine.

Very little of the resin is left in solution in the lower stratum of liquid, but nearly all the camphor; and when poured upon paper, it evaporates, leaving it behind in white powder, without any stain.

The mean of the three analyses of the natural resin, one made by ether, and the other two by alcohol, gives the following result:

Extractive matter soluble in water	-	0.4
Resin soluble in alcohol and ether	-	62.6
Resin insoluble in alcohol and ether	-	37.0
		100.0

There can be little doubt but that if this resin can be obtained in sufficient quantity, that it may become a very valuable acquisition to the arts.

On some Combinations of Platinum. By Mr. John Thomas Cooper. *Addressed to the Editor.*

[From the Journal of Science and the Arts, for March 1817.]

I beg leave to transmit to you, an account of some new combinations of platinum, which I discovered while engaged in experiments on that metal: should you conceive them of sufficient interest, you will be pleased to afford them a place in your Journal.

I have obtained an alloy of this metal, different from any hitherto recorded; it is a compound of 7 parts platinum, 16

copper, and 1 zinc. The platinum and copper are first fused with the usual precaution of covering the metals with charcoal, and adding a flux of borax. When it is in perfect fusion, it is removed from the fire, the zinc is added, and after stirring the mass, an alloy will be formed, having the colour, malleability, and nearly the ductility of alloyed gold of 16 carats fine: so striking is its resemblance to that precious metal, that it might, with equal facility, be employed for the fabrication of articles of utility and ornament, as it never becomes oxidated by exposure to air, under ordinary circumstances, nor is it acted on by nitric acid, unless at a boiling heat.

I have stated this alloy to be eminently ductile and malleable, but it is only so when absolutely free from iron. I have found the presence of $\frac{1}{2}$ a grain of iron in 4oz. of the alloy, has rendered it very brittle, and has consequently impaired both its malleability and ductility,

The pure alloy can be rolled into laminæ, as thin as gold, and I have drawn it into wire $\frac{1}{350}$ of an inch in diameter, and in either of these states it can be dissolved in nitric acid, the specific gravity of which is not less than 1.25.

It has generally been stated, that there exist two oxides of platinum, an opinion with which I am willing to coincide, but I apprehend, that the proportions of oxygen are too highly rated, and that instead of oxides, triple salts, mixed with the oxides, have been obtained.

The two oxides are stated by Chenevix, to contain 7 and 13 oxygen, combined with 100 metal, and by Berzelius, 8.287 and 16.38 oxygen with 100 platinum; but the sequel, I think, shows that the protoxide has never before been obtained in a pure state, and that it consists of 100 platinum, united with only 4.317 oxygen. Indeed, the methods used by Chenevix, must have procured him triple salts. The mode adopted by Berzelius, seems equally liable to objection. He obtained his peroxide by precipitating muriate of platinum by quicksilver; but in such cases, it is extremely difficult to prevent adulteration of mercury in the precipitate; and his method of procuring the protoxide is not less objectionable. He obtains it by exposing muriate of platinum to heat, ascertain-

ing the quantity of chlorine given off, and estimating the quantity of oxygen that in other substances exists in the bases, united to an equal quantity of chlorine.

The protoxide may by obtained by pouring a perfectly neutral solution of mercury into a dilute solution of muriate of platinum, in hot water; a dense powder will precipitate, varying in colour from deep brown to yellow, and sometimes olive green. The powder, which is a compound of calomel and protoxide of platinum, is to be very carefully washed and dried, and then exposed to a heat, not more than sufficient to raise the calomel: that being done, there will remain an intense black powder, which is the protoxide of platinum.

In order to ascertain the proportion of oxygen in this oxide, which has always been much over-rated, I have undertaken a variety of experiments. 100 grains of the powder were heated to intense redness in a bent tube of green bottle glass, furnished with a cap and stop cock, and exhausted of common air. After giving off 12.5 cubic in. of oxygen, which were collected over mercury, the oxide was reduced to the metallic state: on examination, the metal was found to be very slightly coherent, but sufficiently so to enable me to remove it in one piece: it was now weighed, and found to have lost 4.7 grains: on examining the oxygen that had been liberated, it was found to be quite pure, as it required for its saturation, as nearly as possible, twice its volume of pure hydrogen.

100 grains of the oxide, mixed with 30 grains of pure lamp black, were introduced into a similar tube, with stop cock, &c. which, after exhaustion, was heated as before to redness: the cock was afterwards opened under mercury, and the gas received in a graduated jar: it measured 12.8 cubic in.; and this gas, on being exposed to a solution of caustic potass, was all absorbed, except a residuum of 0.35 cubic in., which possessed all the characters of azote. It is needless to state, that the gas absorbed, was carbonic acid.

The materials in the retort, being taken out and weighed, were found to have lost 6.3. gr: 12.5 cubic in. of carbonic acid were produced, which, reduced to standard temperature, would, according to De Saussure, weigh 5.96, leaving a dif-

ference of one-third of a grain, a trifling loss, probably arising from an increased pressure of the atmosphere.

A portion of the oxide, mixed with sulphur, was exposed to heat; sulphurous acid was disengaged, but, through accident, the results were not collected.

A curious property of this oxide should here be mentioned. When heated *per se*, or with combustibles, it is easily reduced, but when mixed with enamellers flux, it is capable of sustaining a very intense heat, without decomposition; indeed, it has withstood reduction in the most violent degree of heat I was able to give it. From this property, it will become an article of the greatest importance in the art of enamelling, as all blacks hitherto employed, are compounds of iron, cobalt, or manganese, which only afford a black colour, when used in body, the lighter washes appearing either purple, blue, or brown, as either of these oxides predominate. We can now, however, produce an enamel colour, which preserves an intense black in the lighter shades, and is, moreover, capable of sustaining the most violent fire, without injury, which none of the former colours will bear, without change; and hence I conceive the artist is at length in possession of one of the most important colours, which, among a few others, has long been a desideratum with enamellers. From the success I have hitherto met with, I may indulge in the hope, that my endeavours will enable me to succeed in producing, for the use of the enameller, a complete set of permanent colours and bases, the want of which has long been felt, and has probably retarded that branch of art from reaching the eminence it is capable of attaining.

There is another very valuable colour, produced by precipitating a neutral solution of platinum, by metallic tin, which is brown, and like the foregoing, is capable of bearing any degree of heat without decomposition. The process is tedious, requiring many days before the whole of the metal is precipitated. The precipitate of platinum, by muriate of tin, may also be employed, but it is neither so bright a colour, nor so dense as that by tin alone.

The black oxide of platinum, which I conceive to be the protoxide, is not soluble in any acid, except the muriatic. By

long digestion, with the assistance of heat, it dissolves in this acid without effervescence, and a dark coloured solution is obtained, similar to that produced by the action of nitro-muriatic acid on platinum; its habitudes being precisely those of that salt so obtained. It is capable of crystallizing, and its crystals present a similar aspect to those of the nitro-muriatic salt, or muriate of platinum, as it is called: when heated, water, at first, is disengaged, and lastly, considerable quantities of chlorine.

From the foregoing results, we may deduce the weight of an atom of platinum. The protoxide gives off by heat 12.5 cubic in. of oxygen, which, at the temperature of 48°, weigh 4.317 gr., which accords with its loss of weight, excepting a trifling loss of one-third of a grain, which may be attributed to the accidental presence of a minute quantity of moisture: from the result, we calculate

$$\left.\begin{array}{l}4.317:95.682\\4.517:100.\end{array}\right\}::1:22.164$$

as the equivalent expression of an atom of platinum.

By pouring a neutral solution of tartrate of soda into muriate of platinum, moderately diluted, no action takes place while cold; but if it be heated to about 180° or 200° of Fahrenheit, a decomposition ensues, an instantaneous change of colour is produced, and a blackish powder precipitates. This powder requires considerable washing, with repeated affusions of boiling water to free it entirely from the acids; if it be now dried, it will appear of a grayish black colour. To determine its composition, it was dried on a sand bath, the temperature of which was 300°, in order to free it entirely from loose water: it was then heated in a tube similar to that employed in the former experiments, but nothing was given off except a small quantity of water too minute to be collected; its amount was estimated by heating 100 grains to redness by which it lost 2,8 grs.; no ascertainable quantity of gas was disengaged, for on opening the stop cock under mercury after the vessel had cooled, the mercury rushed in and filled the tube, with the exception of the remnant that had escaped the air pump. I made other experiments with precisely the same results; all therefore that I could obtain from this substance,

was platinum and water, and I consider it as a hydrate of that metal. I have already mentioned the necessity of washing this powder with large quantities of water, and if this be not attended to, both carbonic acid and carburetted hydrogen will be obtained on heating it, from the decomposition of the tartaric acid.

If we consider the equivalent of an atom of platinum to be 22,164, we must conclude the hydrate to be composed of two atoms of platinum and one of water; should it be considered like other hydrates as constituted of one atom of platinum and one of water, then the equivalent expression of the atom of platinum must be doubled, and it will be 44,328.

It possesses the peculiar character of other hydrates: when heated, it undergoes no change until it arrives at the point of ignition, when it suddenly becomes incandescent, and its particles are seen to approximate considerably. This effect is easily shown, by heating a few grains of the hydrate upon a strip of platinum, over a spirit lamp.

I have reduced considerable quantities of this hydrate in crucibles of various kinds, and have always found it to occupy less than one-eighth of the bulk it filled before ignition, even if pressed together with considerable force: after undergoing this process, its particles are so agglutinated, as to resist separation, and when struck by the blows of a hammer, upon a hard surface, it extends considerably before it separates; by repeated heating and hammering, it may be wrought into a solid bar. This will afford the most ready and easy method of making malleable platinum, an operation allowed to be difficult of execution. I have thus succeeded in reducing it into bars which have undergone the operation of rolling into very fine laminæ, and have also drawn it into wire $\frac{1}{150}$ of an inch in diameter.

I am at present engaged in some other experiments upon this subject, of which I shall send you the results.

Very respectfully yours,

J. T. COOPER.

76, *Drury-lane,*
March 16*th*, 1817.

Some Experiments and Observations on a new Acid Substance. *By* M. FARADAY, Chem. Assistant in the Royal Institution.

[From the Journal of Science and the Arts, for March 1817.]

SIR H. DAVY, during his investigations on flame, discovered a method of exhibiting those combinations of bodies, which he had ascertained to take place at temperatures below that sufficient to inflame them; and whilst pursuing his enquiries on these new and singular phenomena, observed the formation of a peculiar acid body from ether. He has mentioned this body in a Paper read before the Royal Society, which will shortly be published; and he requested me to make some experiments on this substance, the results of which I shall now at his desire detail.

When a fine platina wire is heated and placed over the surface of ether, in an open glass, a pale lambent flame plays around it, and peculiar pungent fumes arise. Generally the heat of the wire is increased; it becoming at last red, and even white hot, and frequently inflaming the ether. If a heated glass or earthen-ware rod be placed over the surface of the ether, the pale flame is seen, and the vapours arise, but the effect soon ceases, from the cooling of the heated substance. The production of these fumes takes place at all temperatures, from a heat a little above the boiling point of mercury, until the ether is inflamed.

The vapours are very acrid and pungent, and very much resemble chlorine in smell: they affect the eyes in a manner similar to azotane: they redden moistened litmus paper. When a rod dipped in ammonia is held in them, they combine with the alkali, producing white fumes.

Sulphuric ether produces them most abundantly, but they may be obtained from the other ethers also. When nitric ether is used, as it inflames at a much lower temperature, it is more difficult so to manage the wire, as to produce the vapours: but if it be previously mixed with solution of potash, or other alkalies, then it succeeds as well as sulphuric ether, and th

vapours formed, being unmixed with any nitrous vapours, are unequivocal in their characters.

Muriatic ether mixed with potash also produces the peculiar vapour, but not so abundantly as sulphuric or nitric ether. The wire easily retains its temperature, but does not very often inflame the fluid.

Acetic ether requires to be warmed before it will succeed well in preserving the wire at a red heat; and I have never yet observed the formation of the acid fumes from it.

I endeavoured to obtain a quantity of the acid in a pure form: for this purpose, some ether was thrown into a bladder, which was then filled with common air, and the mixture of air and vapour made to traverse a heated glass tube, containing pieces of platina wire and foil; the end of the tube descended into a bottle placed in a freezing mixture, and after passing many bladders of air slowly through the tube, the results were examined. Some charcoal remained on the pieces of platina; much carbonic acid had been formed and dissipated; and there was found in the bottle an aqueous solution of the peculiar acid.

The quantity obtained in this way, even after the process had been continued for some hours, was very small. The solution was clear and colourless, of a slightly acid taste and strong irritating smell. It reddened litmus paper, as did also its vapours. When heated, the acid was quickly dissipated, leaving, on being evaporated to dryness, a slight coally mark on the capsule.

I distilled some of the solution from fused muriate of lime, hoping to procure the acid in its pure form, but obtained no decisive results. No permanent gas was given off, nor did any fluid distil over, until the acid was decomposed by the heat; but the quantity was too small to present distinct phenomena.

The solution of the acid added to ammonia, combined with it and formed a neutral salt, which, by careful evaporation, was obtained in the solid form. This was very volatile, rising at a temperature even below that of boiling water, and producing a peculiar fœtid smell, not much like the acid, but quite as unpleasant.

Muriate of lime decomposes the carbonate of ammonia, a

triple muriate being formed, and carbonic acid separating; and as the new acid appeared to possess affinities in some cases not even so strong as those of carbonic acid, I hoped to obtain it pure by a similar decomposition; but on making the experiment, was still unsuccessful. The salt being distilled with fused muriate of lime, nothing came over but a small quantity of a fluid, possessing no acid properties, and appearing to be water: a decomposition had however taken place; for on increasing the heat, ammonia was driven over; but here, as before, the small quantity I could use was against the experiment.

The acid solution added to potash and soda saturated them, and rendered them neutral. The solution with potash bore the application of heat for some time, until a certain degree of concentration being obtained, it began to decompose, and soon became strongly alkaline, the acid flying off. When in this state, if suffered to cool, it crystallised; and if left exposed to the air, soon deliquesced. If evaporated to dryness and heated, the subsalt was decomposed, and the acid destroyed.

The neutral alkaline solutions precipitated salts of silver and mercury, but not of other metals: the precipitates were soluble in a large proportion of water.

The acid solution decomposes the carbonate and subcarbonate of potash, soda, and ammonia, giving off carbonic acid: it also decomposes the bi-carbonate of magnesia. It has no action on the carbonate of lime, even when newly precipitated; and in several other cases I have thought its affinities were weaker than those of carbonic acid.

The salts which it forms with the alkalies are decomposed by the common acids, and the peculiar vapour flies off; so much however is generally decomposed by the acid or heat (if evaporated), as to discolour the residuum.

From the small quantities in which I have been able to form it, I had no hope of ascertaining the proportion of its constituent parts; but from some minute experiments, I judge it to be composed of oxygen, hydrogen, and charcoal. A neutral solution of it with potash was evaporated to dryness and distilled, 2.17 cubical inches of gas were received over mer-

cury, and much charcoal remained with the alkali in the retort. The gas rendered lime water turbid, and being agitated with solution of potash, became 1.6 cubical inches. This was inflammable, and burned with a light flame; four volumes of it detonated by the electric spark with six of oxygen, became two, which with four of nitrous gas became two; so that it appeared to be a mixture of carbonic oxide and hydro-carbonate. Oxygen, hydrogen, and charcoal may therefore be considered as the elements of the acid: the latter, from the quantity left in the retort, appearing to be in very great proportion.

The peculiar character of this acid is the irritating effect it produces on the eyes and nostrils. In this it somewhat resembles the oxalic acid, but is more pungent. This character belongs in part to its salts; at least its combination with ammonia, when volatilised, possesses similar powers, though not so strong.

Among other fruitless attempts to obtain it, I used an atmosphere of oxygen and carbonic acid in place of common air, and receiving the gas over mercury, was in hopes of separating the carbonic acid by lime or some other agent, which would leave the new acid. I also distilled the neutral solution of it with potash, until rendered alkaline; but the very small quantities in which it is formed, and the ease with which it quits its compounds, have prevented the performance of any decisive experiments upon it; and until some other process has been discovered for producing it, there is little hopes of its being obtained in the pure state.

On the Oopas, or Poison Tree of Java.

BY T HORSFIELD, M. D.

[From the Journal of Science and the Arts, No. IV.]

The singular imposition on the scientific world, respecting the Oopas tree, published in Holland in 1783, makes the account of Dr. Horsfield, given in this volume, particularly interesting.

The history and origin of this celebrated forgery still re-

main a mystery. Foersch, who put his name to the publication, was a surgeon in the Dutch East India Company's service. Having hastily picked up some vague information concerning the oopas, he carried it to Europe, where his notes were arranged, doubtless by a different hand, in such a form, as by their plausibility and appearance of truth, to be generally credited. It is in no small degree surprising that so palpable a falsehood should have been asserted with so much boldness, and have remained so long without refutation—or that a subject of a nature so curious and so easily investigated, relating to its principal colony, should not have been enquired into, and corrected by the naturalists of the mother country.

To a person in any degree acquainted with the geography of the island, with the manners of the Princes of Java, and their relation to the Dutch Government at that period, or with its internal history during the last 50 years, the first glance at the account of Foersch must have evinced its falsity and misrepresentation.

But though the account just mentioned, in so far as relates to the situation of the poison tree, to its effects on the surrounding country, and to the application said to have been made of the oopas on criminals in different parts of the island, as well as the description of the poisonous substance itself, and its mode of collection, has been demonstrated to be an extravagant forgery,—the existence of a tree on Java, from whose sap a poison is prepared, equal in fatality, when thrown into the circulation, to the strongest animal poisons hitherto known, is a fact, which is fully established by the author of the present paper.

The tree which produces this poison is called, antshar, and grows in the eastern extremity of the island.

The work of Rumphius contains a long account of the oopas, under the denomination of arbor toxicaria: the tree does not grow on Amboina, and his description was made from the information he obtained from Macassar.

His figure was drawn from a branch of that which was called the male tree, sent to him from the same place, and established the identity of the poison tree of Macassar and the other eastern islands with the antshar of Java.

The account of this author is too extensive to be abridged in this place; it concentrates all that has till lately been published on this subject. It is highly interesting, as it gives an account of the effects of the poisoned darts, formerly employed in the wars of the eastern islands, on the human system, and of the remedies by which their effect was counteracted and cured.

The simple sap of the arbor toxicaria, (according to Rumphius,) is harmless, and requires the addition of ginger and several substances analogous to it, to render it active and mortal. In so far it agrees with the antshar, which, in its simple state, is supposed to be inert; and before being used as a poison, is subjected to a preparation, which will be described after the history of the tree. The same effervescence and boiling which occurs on the mixture of the substances added to the milky juice by the Javanese in Blambangan, has been observed in the preparation of the poison of Macassar, and in proportion to the violence of these effects the poison is supposed to be active.

Besides the true poison tree, the oopas of the eastern islands, and the antshar of the Javanese, Java produces a shrub, which, as far as observations have hitherto been made, is peculiar to the same, and by a different mode of preparation, furnishes a poison far exceeding the oopas in violence. Its name is tshettik.

The antshar is one of the largest trees in the forest of Java. The stem is cylindrical, perpendicular, and rises completely naked to the height of sixty, seventy, or eighty feet. It is covered with a whitish bark, slightly bursting in longitudinal furrows: near the ground this bark is, in old trees, more than half an inch thick; and, upon being wounded, yields plentifully the milky juice from which the celebrated poison is prepared. A puncture or incision being made in the tree, the juice or sap appears oozing out, of a yellowish colour; from old trees, paler: and nearly white from young ones: when exposed to the air, its surface becomes brown. The consistence very much resembles milk, only it is thicker, and viscid. This sap is contained in the true bark (or cortex), which, when

punctured, yields a considerable quantity, so that, in a short time, a cup full may be collected from a large tree.

Previous to the season of flowering, about the beginning of June, the tree sheds its leaves, which re-appear when the male flowers have completed the office of fecundation. It delights in a fertile and not very elevated soil, and is only found in the largest forests. Dr. H. first met with it (the antshar) in the province of Poegar, on his way to Banjoowangee. In clearing the new grounds in the environs of Banjoowangee for cultivation, it is with much difficulty the inhabitants can be made to approach the tree, as they dread the cutaneous eruption which it is known to produce when newly cut down. But, except when the tree is largely wounded, or when it is felled, by which a large portion of the juice is disengaged, the effluvia of which mixing with the atmosphere, affect the persons exposed to it, with the symptoms just mentioned, the tree may be approached and ascended like the other common trees in the forests.

The antshar, Dr. H. observes, like the trees in its neighbourhood, is on all sides surrounded by shrubs and plants: in no instance have I observed the ground naked or barren in its immediate circumference.

The largest tree I met with in Blambangan was so closely environed by the common trees and shrubs of the forest in which it grew, that it was with difficulty I could approach it. And at the time I visited the tree, and collected the juice, I was forcibly struck with the egregious misrepresentation of Foersch. Several young trees spontaneously sprung from seeds that had fallen from the parent, reminding me of a line in Darwin's Botanic Garden,

"Chained at his root two scion Demons dwell."

While in recalling his beautiful description of the oopas, my vicinity to the tree gave me reason to rejoice that it is founded on fiction.

The tshettik is a large winding shrub. In large individuals it has a diameter of two or three inches, covered with a reddish brown bark, containing a juice of the same colour, of a peculiar pungent, and somewhat nauseous odour.

From this bark the poison is prepared.

It is very rarely met with, even in the wilderness of Blambangan.

The process of preparing the antshar was performed for me by an old Javanese, who was celebrated for his superior skill in preparing the poison. About eight ounces of the juice of the antshar, which had been collected the preceding evening, in the usual manner, and preserved in the joint of a bamboo, was carefully strained into a bowl. The sap of the following substances, which had been finely grated and bruised, was carefully expressed and poured into it, viz.—Arum, Nampoo, (Javanese,) Kaemferia, Galanga, Kontshur, Amomum, Bengley, (a variety of zerumbed,) common onion and garlic, of each about half a dram; the same quantity of finely powdered black pepper was then added, and the mixure stirred.

The preparer now took an entire fruit of the capsicum fruticosum or Guinea pepper, and having opened it, he carefully separated a single seed, and placed it on the fluid in the middle of the bowl.

The seed immediately began to reel round rapidly, now forming a regular circle, then darting towards the margin of the cup, with a perceptible commotion on the surface of the liquor, which continued about one minute. Being completely at rest, the same quantity of pepper was again added, and another seed of the capsicum laid on as before: a similar commotion took place in the fluid, but in a less degree, and the seed was carried round with diminished rapidity. The addition of the same quantity of pepper was repeated a third time, when a seed of the capsicum being carefully placed in the centre of the fluid, remained quiet, forming a regular circle about itself, in the fluid, resembling the halo of the moon. This is considered as a sign that the preparation of the poison is complete.

The tshettik is prepared by separating the bark of the root, and boiling it, and after separating the bark from the water, exposing the extract to the fire till it is about the consistence of syrup. After this the preparation is the same as of the antshar.

An account of 26 experiments, is detailed by Dr. Hors-

field, on which he remarks, that he has selected from a large number of experiments, those only which are particularly demonstrative of the effects of the antshar and of the tshettik, when introduced into the circulation. The poison was always applied by a pointed dart or arrow, made of bamboo.

The operation of the two different poisons on the animal system is essentially different.

The first 17 experiments were made with the antshar; the rapidity of its effect depends, in a great degree, on the size of the vessels wounded, and on the quantity of poison carried into the circulation.

In the first experiment, it induced death in 26 minutes,—in the second, in 13 minutes. The poison from different parts of the island has been found nearly equal in activity.

The common train of symptoms is, a trembling and shivering of the extremities, restlessness, discharges from the bowels, drooping and faintness, slight spasms and convulsions, hasty breathing, an increased flow of saliva, spasmodic contractions of the pectoral and abdominal muscles, retching, vomiting, excremental vomiting, frothy vomiting, great agony, laborious breathing, violent and repeated convulsions, death.

The effects are nearly the same on quadrupeds, in whatever part of the body the wound is made. It sometimes acts with so much force, that not all the symptoms enumerated are observed.

The oopas appears to affect different quadrupeds with nearly equal force, proportionate, in some degree, to their size and disposition. To dogs it proved mortal, in most experiments, within an hour. A mouse died in ten minutes; a monkey in seven minutes; a cat in fifteen minutes.

A buffalo, one of the largest quadrupeds of the island, died in two hours and ten minutes, though the quantity of poison introduced in this experiment was proportioned to that which was thrown into the system in the experiments on smaller animals.

If the simple or unprepared sap is mixed with the extract of tobacco or stramonium, (instead of the spices mentioned in the account of the preparation,) it is rendered equally, perhaps more active.

Even the pure juice, unmixed and unprepared, appears to act with a force equal to that which has undergone the preparative process, according to the manner of the Javanese at Blambagan.*

Birds are very differently affected by this poison. Fowls have a peculiar capacity to resist its effects. A fowl died 24 hours after the wound; others have recovered after being partially affected.

In regard to the experiments made with the poison prepared from tshettik, its operation is far more violent and rapid than that of the antshar, and it affects the animal system in a different manner; while the antshar operates chiefly on the stomach and alimentary canal, the respiration and circulation, the tshettik is determined to the brain and nervous system.†

A relative comparison of the appearances on dissection, demonstrates, in a striking manner, the peculiar operation of each.

After the previous symptoms of faintness, drowsiness, and slight convulsions, it acts by a sudden impulse, which, like a violent apoplexy, prostrates at once the whole nervous system.

In the two experiments, this sudden effect took place on the sixth minute after the wound; and in another on the seventh minute, the animals suddenly started, fell down head foremost, and continued in convulsions till death ensued.

This poison affects fowls in a much more violent manner than that of the antshar, death having frequently occurred within the space of a minute after the puncture with a poisoned dart.

The simple unmixed decoction of the bark of the root of the tshettik, is nearly as active as the poison prepared according to the process above related.

* We certainly were surprised at the doctor's statement of the process of preparation, which, in fact, seems to add nothing to the violence of the poison.

† Mr. Brodie, in a paper on vegetable poisons, (Phil. Trans. 1811) has given an account of some experiments made by him with the *upas antiar*, from Java, furnished by Mr. Marsden, from which it appears, that when inserted in a wound, it produces death, (as the infusion of tobacco does, when injected into the intestines,) by rendering the heart insensible to the stimulus of the blood, and stopping the circulation.

The resinous portion of the bark is by no means so active as the particles soluble in water.

Taken into the stomach of quadrupeds the tshettik likewise acts as a most violent poison, but it requires about twice the period to produce the same effect which a wound produces; but the stomachs of fowls resist its operation.

The poison of antshar does by no means act so violently on quadrupeds as that of the tshettik. Dr. H. observes he gave it to a dog; it produced at first nearly the same symptoms as a puncture; oppression of the head, twitchings, faintness, laborious respiration, violent contraction of the pectoral and abdominal muscles, an increased flow of saliva, vomiting, great restlessness and agony, &c., which continued nearly two hours; but after the complete evacuation of the stomach by vomiting, the animal gradually recovered.

Rumphius asserts that a small quantity may be taken internally as a medicine.

In animals killed by the antshar, the large vessels in the thorax, the aorta and venæ cavæ were, in every instance, found in an excessive degree of distention: the viscera in the vicinity of the source of circulation, especially the lungs, were uniformly filled in a preternatural degree with blood; which in this viscus and in the aorta, still retained a florid colour, and was completely oxygenated. On puncturing these vessels, it bounded out with the elasticity and spring of life. The vessels of the liver, of the stomach, and intestines, and of the viscera of the abdomen in general, were also more than naturally distended, but not in the same degree as those of the breast. In the cavity of the abdomen a small quantity of serum was sometimes effused.

The stomach was always distended with air, and in those instances in which the action of the poison was gradual, and in which vomiting supervened in the course of the symptoms, its internal coat was covered with froth.

The brain indicated less of the action of the poison, than the viscera of the thorax and abdomen. In some instances it was perfectly natural—in others, marks of a small degree of inflammation were discovered.

An undulatory motion of the skin and of the divided muscles was very evident in some of the dissected animals.

The appearances observed in the animals destroyed by the tshettik were very different. In a number of dissections, the viscera of the thorax and abdomen were found nearly in a natural state, and the large vessels of the thorax exhibited that condition in which they are usually found after death from other poisons.

But the brain and the dura mater showed marks of a most violent and excessive affection. In some instances the inflammation and redness of the dura mater was so strong, that on first inspection Dr. H. supposed it to be the consequence of a blow previously received, until he found by repeated examinations, that this is a universal appearance after death from tshettik.

Rumphius had an opportunity of personally observing the effect of the poisoned darts or arrows on the human system, as they were used by the natives of Macassar, in their attack on Amboina, about the year 1650.

Speaking of their operation, he says, the poison *touching* the warm blood, is instantly carried through the whole body, so that it may be felt in all the veins, and causes an excessive burning, and violent turning in the head, which is followed by fainting and death.

After having proved mortal to many of the Dutch soldiers in Amboina and Macassar, they are said to have finally discovered an almost infallible remedy in the root of the Crinum asiaticum, (called by Rumphius, radix toxicaria,) which, if timely applied, counteracted, by its violent emetic effect, the force of the oopas.

An intelligent Javanese informed Dr. Horsfield, that an inhabitant was wounded in a clandestine manner, by an arrow thrown from a blow pipe, in the fore arm, near the articulation of the elbow. In about fifteen minutes he became drowsy, after which he was seized with vomiting, became delirious, and in less than half an hour he died.

Remarks on the Preservation of Lime Water, by H. Dewar, M. D. Fellow of the Royal College of Physicians, Edinburgh.

[From the Edinburgh Medical and Surgical Journal for April 1817.]

Dear Sir,—Considering the present mode of preserving lime water as susceptible of improvement, I shall, in a few words, communicate to you my observations on the subject, that, if you see proper, you may insert them in the Edinburgh Medical and Surgical Journal.

According to the plan usually followed, the water, after being impregnated, is filtered, and put up in large bottles, from which it is removed to smaller ones from time to time, as it is needed. These smaller bottles are still of such size, that they must be repeatedly opened and stopped before their contents are exhausted. This evidently brings along with it the frequent admission of atmospheric air, in quantities proportioned to the space left above the solution in the bottles. Hence we generally find the bottle in common use is more or less dimmed with a precipitate of carbonate of lime, formed by the carbonic acid of the atmosphere, which renders the solution turbid, and gives us reason to conclude, that it must be impaired in strength.

Wishing to have a quantity of good lime-water constantly at hand, for the sake of experiments, I have found the following method completely satisfactory: Instead of filtering the solution, to keep it in contact with a quantity of quick-lime, in a tall wide-mouthed bottle, and to decant from the upper part, as much as is at any time wanted; to fill the bottle immediately again with water, and shake it in the same manner as when the lime-water is first made. This excludes all carbonic acid, and affords a fresh supply of the solution. It is preferable to the plan of keeping quick-lime bottled up in a dry state, which is apt to break the bottles; and, when at any time exposed, exhibits a more extensive surface to the action of carbonic acid.

When the simple plan now described is followed, even though precipitation by the carbonic acid should, in a slight degree, take place, the solution thus weakened is quickly re-saturated by the presence of the quick-lime. Thus it is always kept in its strongest state, and may be obtained perfectly limpid. The trouble of inquiring frequently for fresh burned limestone, which, in some situations, may be considerable, is avoided, as well as that of filtering. This would, indeed, be a paltry recommendation, were it not that the trouble is of no utility, every object being more advantageously obtained without it. The filtering, besides, implies a degree of exposure which must be injurious.

I can conceive no objection to which this little plan of chemical and pharmaceutical economy is liable. On the contrary, I trust that it requires only to be mentioned to have its advantages appreciated, and to be generally adopted. Apothecaries and druggists may keep their stock in very tall and wide-mouthed bottles, with quick-lime at the bottom, from which it may from time to time be drawn off, either by the use of a syphon, or by careful decantation, and put aside in vials containing the quantities most generally asked for.

George Street, Edinburgh, Dec. 3, 1816.

Case of Un-united Fracture of the Os Humeri, treated successfully by the seton. By Josias Stansfield, Esq., Surgeon to the Leeds Infirmary.

[From the Medico-Chirurgical Transactions, Vol. VII. Part I.]

William Fisher, aged 48, a strong healthy man, was thrown from a stage-coach on the 4th of December 1814, and fractured his left arm. He was immediately taken to a neighbouring surgeon, who adjusted the fracture, and applied a roller and splints; these were removed at the end of four or five weeks, when it was discovered that no union whatever had taken place. Frictions were then employed, and the parts daily bathed with hot water, but without producing any beneficial effect, and the patient's arm continued in a useless state

to July 1815, the period of his admission into the Leeds Infirmary. On examination I found very considerable motion at the fractured part, so that the two portions of bone could be made to form a very considerable angle; he was also unable to raise the arm from the side. The fracture was very oblique, the extent of fractured surface being, as nearly as I could ascertain, four inches; commencing near the insertion of the deltoid muscle, and terminating within two or three inches of the elbow joint. Both arms were equal in length. By pressing deeply between the biceps muscle and the bone, I could feel the sulcus of the fracture, and it was indistinctly perceptible on the outer side. The nature of this injury being favourable for the passage of a seton between the fractured ends, as recommended by Dr. Physick of America, I determined to try this mode of treatment; and accordingly on the 28th of July, I commenced the operation, by making a division of the integuments, an inch and a half long, on either side of the bone, about the centre of the fracture; the biceps muscle was then drawn inwards, and the cellular membrane divided, down to the sulcus; on the outer side I was obliged to divide some fibres of the triceps muscle; a curved seton needle was now easily pushed betwixt the ends, the intervening substance being very soft. The seton string consisted of a skein of silk, doubled and well waxed. The lips of the wounds were drawn together by strips of adhesive plaister, and a compress and bandage applied. On the following day, the patient was in very great pain, and had a smart attack of fever, which induced me to take off the dressings, and apply a bread poultice, adopting at the same time the antiphlogistic regimen. This plan was continued till the inflammation had subsided, and suppuration was completely established. During the first fortnight, the slightest motion of the arm gave him very acute pain; but by the 16th of August being comparatively easy, I dressed the wounds with ointment and lint, and applied a compress and splints, supporting the whole by two leather straps; his arm was allowed to hang by his side, by which it was kept straight, and this position was the easiest to him.

He was now ordered to get up daily, and walk out in the open air as much as he could bear to do without fatigue; to

have as much meat and porter as agreed with him, and to take the decoction of bark with dilute vitriolic acid. From this period the wounds were dressed daily, and the arm kept as clean as possible, which prevented the accession of any inflammation of the skin. The seton string was moved backwards and forwards several times at each dressing, in order to preserve the effect of the stimulus, which gave the patient considerable pain. By the 26th of August the arm had gained some strength, as it could be raised a little from his side without giving way. On the 8th of September, a seton string of half the size was passed, from which time he experienced no uneasiness. September 18th, the arm could be raised to a horizontal position without bending, and he could himself raise it very considerably. By the 30th of September no motion whatever was perceptible at the fractured part, but as he remained easy, the seton string was not withdrawn till the 3d of October. The wounds soon after healed, and he was directed to wear a bandage round his arm for some weeks, also to rub it extremely well, and use it freely. I saw him again on the 3d of November, when he could carry his hand to the back of his head, his arm feeling as strong and useful as before the accident.

Leeds, 20*th December*, 1815.

History of a Tumor successfully removed from the Face and Neck, by previously tying the Carotid Artery. By William Goodlad, Esq., member of the Royal College of Surgeons, and Surgeon at Bury, Lancashire.

[From the Medico-Chirurgical Transactions, Vol. VII. Part I.]

The carotid arteries furnish so large a portion of the blood transmitted to the brain, that practitioners have been till very lately deterred from securing them by ligature, lest the functions of that important organ should be so much impaired as to destroy life. Mr. Abernethy was the first who tied the left carotid, which he did in a man who had the internal, and many branches of the external artery, divided by the horn of a

cow. The patient lived only thirty hours, and died from the functions of the brain being injured.

This operation was, therefore, so little encouraging, as to be justifiable only where death must otherwise be inevitable; since that period the carotid has been tied by Mr. A. Cooper, and by Mr. Travers; but I believe there is no instance on record of its being secured, by ligature, in order to render the removal of a tumor practicable; the following instance of its successful adoption will therefore, I hope, be worthy the acceptance of the society.

On Thursday, August 31st, I was desired to visit Mrs. Kershaw, of Middleton, a thin, middle aged woman, upon whose case a consultation had been held the preceding day, at Manchester; the general result of which was that no operation was advisable. She had a large tumor extending from near the external canthus of the left eye, down the cheek to the infra-orbitary foramen and the root of the ear, which was elevated by the tumor, and, passing under it, it extended behind the mastoid process. Anteriorly it extended to the chin, and to the trachea, which it partially covered, and hung pendulous over the clavicle. The circumference of the base of the tumor, when last measured, was twenty inches, since which period it had increased rapidly, but I regret not having ascertained its exact size; it must, however, from the space it occupied, have been at least twenty-eight inches.

In the upper portion, comprised between the cornu of the os hyoides upwards to above the zygoma, the tumor in the base was as large as, or larger than in its middle or apex, but below this point, its attachment to the neck was less extensive; and though hanging pendulous over the clavicle, its lowest connexion with the neck was three quarters of an inch distant from that bone. On elevating the tumor in this lower space with a hand on each side, and passing the fingers at the same time under it, it might clearly be ascertained that there was no connexion with the vessels; but as it hung over the trachea, and was connected with it, it required a very careful examination to be convinced that they were not united. The cornu of the os hyoides was however moveable under the tumor, and independent of it; respiration was tolerably free,

when in an erect posture, and on passing the fingers forcibly between these parts, I was pretty well convinced that they might be separated. The œsophagus here was too deep to be implicated in the disease.

Above the cornu of the hyoid bone, the base of the tumor was very extensive, and deep, impeding deglutition considerably. On directing the finger, passed into the mouth, towards the base of the ramus and angle of the maxillary bone, and into the fauces, the intervening substance appeared considerable, and authorized an opinion that the fauces would not be cut into, nor indeed exposed, by its removal. The submaxillary gland was pressed inwards, but did not appear enlarged or hardened, and the membrane of the cheek was also healthy, though the tumor appeared in contact with it.

The disease commenced behind the angle of the jaw, and now extended beyond the mastoid process, and was so closely connected with the subjacent parts, that the finger could not be passed under it. Its connexions here, therefore, were only to be ascertained by collateral circumstances; and as the whole site of the parotid gland was covered by it, it became a question worthy of serious consideration, how far that substance was enveloped in the disease, particularly as it had been stated on most respectable authority, that its removal was impracticable. The patient's being able to open the mouth and masticate, was a complete proof, that if the whole substance of the gland were diseased, it had become dragged from its situation by the weight of the tumor, and that the tumor itself did not dip into the fossa behind it. Yet every other circumstance rendered it certain that the parotid gland was enveloped in the disease, which was indeed verified in the operation. But the extent of the disease here became of less importance if the carotid artery were previously secured, as I intended. I ought to have observed that the tumor was perfectly moveable, though its motions were very limited, and that it had, therefore no bony attachment either to the jaw or to the zygoma.

The surface of the tumor was divided into large tuberculi, and the apex of each tubercle was rendered more prominent by a collection of fluid: it was fleshy, but had neither the hardness nor any other external character of carcinoma.

There was no absorbent gland affected in its neighbourhood, and though ulcerated in two points, one of which was extensive, the aspect of the ulcer was not forbidding, being partially granulating and partly sloughing. Fungus hæmatodes was therefore not to be dreaded. Yet a discouraging circumstance arose from a charlatan's having, as he believed, succeeded in removing the complaint by the knife, at an early period of its history, on which occasion the hæmorrhage was very alarming. After a short time the disease reappeared, and had only been nine months in attaining its present enormous size. Large varicose veins spread over the surface, and as the skin was uniformly diseased, ulceration might be expected to extend to them, and hæmorrhage to be an inevitable consequence.

The woman's health was tolerable, though her strength was reduced; and the weight of the tumor, which she generally rested on the shoulder, prevented her from using exercise. She had applied to many practitioners, and to a neighbouring infirmary; but the result had uniformly been unfavourable to her wishes. The consultation which I have mentioned, was called by my friend Mr. Killer, to whom, at the recommendation of a practitioner in the neighbourhood, she had applied as a last resource, and nothing discouraged at the result of it, she was resolutely determined to have the tumor removed, if any one would second her noble resolution by making the attempt.

The objections to the operation were twofold, and depended on the hæmorrhage threatening immediately to destroy the patient; or, this being removed, on the disease being reproduced. The former objection was obviated by tying the carotid artery, and there was no doubt of the disease being removeable except at the part I have mentioned; and as it was agreed by all the consultants that her death was otherwise inevitable, and must soon take place, there appeared at least a chance of her being saved; and however small that chance, I considered a surgeon justifiable in seizing it. The question then turned on the propriety of tying the carotid artery. I had a firm conviction that in both Mr. A. Cooper's cases the patient died,*

* One of these patients recovered.

and this conviction was so strong that I did not refer to them. But though this had been the fact, no surgeon would hesitate, in cases of aneurism, to give his patient the small chance of recovery which an operation offered, after the encouragement, which the insulated instance, as I believed, of success in Mr. Travers's case, afforded, rather than suffer him to die inevitably by the progress of the disease; and if we consider the causes of death, it will appear that none of these causes would be enhanced by the peculiarities of the present case, and the additional operation. The chance of irritation in the trachea, œsophagus, &c. producing cough, and destroying adhesion in the vessel, or in the par vagum, disordering the stomach, was equal in either case, but the danger most to be apprehended from hæmorrhage was less considerable than in aneurism, from the artery being almost certainly healthy. If inflammatory symptoms supervened, they were also likely to be relieved by the discharge of a large suppurating sore; and the loss of blood during the operation, though considerable, would be in this respect advantageous and desirable.

Another consideration was the power of restoration, for the skin covering the tumor was diseased; a large suppurating surface must therefore be exposed and filled by granulations. It was not certain that sufficient power would remain in the part for these operations, especially as the sources from whence they must proceed, were previously weakened by disease. But having expressed my willingness to encounter these difficulties, the woman was importunate for the attempt; and as an alarming hæmorrhage supervened on the third day after my visit, her life could not be materially shortened, and no time ought to be lost. I, therefore, with the consent of Mr. Killer, who had obligingly offered me his assistance, appointed Tuesday, September the 5th, to meet my friends at Middleton, for that purpose. I was disappointed in not having Mr. Killer's valuable assistance, but his place was kindly supplied by my ingenious friend Mr. Jordan, of Manchester, who with accurate anatomical knowledge combines great coolness and dexterity; and in the presence of Messrs. Brigham, Woodcock, Morris, Bingham, and several other gentlemen, the operation was performed in the following manner: the pa-

tient being previously laid upon a table, with her head as low as she could bear, from the danger of suffocation by the pressure of the tumor.

An incision about four inches in length was made through the integuments, and the tumor at the same time brought as much as possible from over the trachea, to reach the edge of the sterno-mastoid muscle; the course of which could not previously be traced, the sternal edge of its tendinous insertion being only just perceptible; blood followed the incision very profusely, but having dissected the sac of the tumor from the neighbouring integument, the inner edge of the muscle came into view, and the platisma myoides being more freely divided, the artery was plainly felt beating at the bottom of the wound. The knife was now laid aside, the cellular membrane separated by the fingers, the arterial sheath exposed, and the vessels secured between the finger and thumb: I endeavoured to separate the fibres of the fascia by the nails of the fore-finger and thumb, so as to pass the finger beneath the artery, and by its constant apposition with the vessel, prevent any other part from being included. The resistance to this attempt was great, and the eyed end of a probe which I had formerly found useful was directed to the outside of the vessel, so as to press against the finger on the opposite side; but though bent at different angles to accommodate it to the wound the shaft of the strongest probe was too slender to be directed with accuracy to so great a depth, and generally turned in the wound. The size of the tumor very much added to the difficulties of this stage of the operation, not only by rendering the wound deeper, but as it was necessary to keep it aside, and this necessarily impeded the fingers; whilst, if left at liberty, by pressing upon the probe, it changed its direction. The point of an aneurismal needle was next tried with no better success, but on directing the shaft of the needle into the wound, it was pressed against the finger with great facility; and when convinced that no part intervened, for the vessel had been stripped of its fascia, except at its posterior part, where, on insinuating it between the thumb and finger, passed on each side, only a few fibres were left undivided, and the division of these being accomplished, the finger was gradually and cautiously

passed under the vessel, with the needle in contact with it, passed from without inwards. But it had to be turned, which in so deep a wound was with difficulty accomplished; and though the greatest care was observed by keeping the finger of the left hand between the end of the instrument and the trachea, and pressing at the extremities of the instrument to bend and accommodate it to the cavity, more violence was done to the vessel than was desirable.

The patient bore this tedious operation with great fortitude, only endeavouring to relieve the irritation which the fingers produced, by a frequent attempt to swallow. A considerable quantity of blood was already lost, and the ligature was therefore immediately tied as low as possible in the wound. She complained of much pain, when the thread was drawn tight, extending from the wound to the whole of that side of the head.

The fluid contained in the apex of each tubercle was next discharged to reduce the size of the tumor, and render it more easily handled, as well as to lessen the pressure on the trachea, of which the patient complained heavily. The incision being then carried along the base of the tumor to its upper part, it was dissected from the cheek; though, during this and the remaining part of the operation, the fingers were used wherever practicable: but occasionally stronger ligamentous bands rendered division by the knife necessary. The hæmorrhage, on dividing the integument, which connected the upper portion of the tumor to the head, where the external veins were ramified over it, was considerable, and on dissecting downwards, the ramus of the jaw became cognizable; and in this part, as well as under and behind the ear, each stroke of the knife was followed by a gush of blood, and occasionally in a tremendous stream, which after continuing for a few seconds, ceased. The patient was very faint when the operation was finished, but a little wine at intervals soon restored her to complete perception.

Besides a general oozing there were a few points from which blood flowed rather freely, though the blood was venous; and as a matter of caution rather than of necessity, they were secured by ligature. The wound now exhibited the fol-

lowing appearances: the whole sterno-mastoid muscle was exposed, and its fibres dissected clean, except about half an inch from its insertion into the clavicle. The wound extended backwards from behind the mastoid process, to the trachea anteriorly, but became narrowed in the direction of the muscle at the lower part of the neck. The submaxillary gland was exposed, and about one fifth of its substance, not appearing healthy, was removed. The digastric and the greater portion of the milo-hyoideus were exposed, the ramus of the jaw was only covered by periosteum, except where covered by the masseter muscle, part of which, not appearing healthy, was dissected away; the whole of the condyloid process of that bone was laid bare in the same manner, and behind it the pterygoid muscles were also exposed. The membrane of the cheek was only covered by a cellular substance, which did not appear healthy; but sufficient skin was saved to cover the zygoma. The parotid gland was entirely removed.

After cleansing the wound, the skin wrapped over as much as possible, was secured by adhesive plaster, covered with a pledget of lint spread with cerate. The patient expressed herself comfortable, though very faint; and the table being brought to the bed-side, she was lifted into it. Her pulse was 110 and very weak.

11 *p. m.* She is very comfortable, except from thirst, and soreness in the throat, which impedes swallowing. Her pulse is risen, though not less frequent. She has made water freely.

Wednesday, 9 *a. m.* (second day.) She was troubled with thirst till midnight, but afterwards slept comfortably; the soreness in the throat is abated, though on swallowing it is perceptible. At 4 *a. m.* she perspired copiously, and her skin is now moist. Pulse 108 and soft: she has passed urine freely; no discharge from the bowels, but she had three motions yesterday previous to the operation. There is a copious secretion of tough mucus from the trachea, no headache or sickness, and the wound is easy. A general oozing of blood has stained the dressings.

9 *p. m.* Pulse 120, skin rather hot and dry; occasional pulsation in the head; no thirst. Discharge of bloody serum from

the wound continues. To have an opiate if restless; and an enema early in the morning if the bowels have not been opened.

Thursday, 9 *a. m.* (third day.) The patient has had a good night without the opiate, having scarcely awoke. Her pulse is now 106 and soft, no pain in the wound, though the face is somewhat swollen. She had a shivering in the night, which was immediately removed by a warm covering, but succeeded by considerable heat.

In addition to the soreness of the throat, she has a trifling cough, which gives no pain. The enema procured three large motions of a good colour and consistence; she makes water freely; and has taken tea and gruel comfortably, but in small quantities.

9 *p. m.* The pulse is again risen to 120 and full. She complains also of some headache, and the throbbing extends down the face; her bowels have not been again moved. She has neither thirst nor heat. The oozing of blood appears to have ceased, and the soreness in the œsophagus and secretion of mucus are somewhat moderated. Her head and neck have been kept moist with tepid water, and she is directed to take one of the following powders every four hours.

R. Hydrarg: submuriat: gr. vj.
Pulveris Antimonial: gr. xvj. M. et divide in chart: vj.

Friday, 9 *a. m.* (fourth day.) I found her with her skin cool and moist, pulse 100 and soft. She passed the night comfortably, the beating in her head is less troublesome, and is perhaps of little consequence, as she is subject to it. The wound discharges copiously, which will relieve any determination to the head. Her bowels have been again opened this morning. She has still a tenderness on swallowing, and a considerable flow of mucus; but her cough, which has been very trifling, has left her.

Friday evening, 8 *p. m.* Pulse 104, but possesses a peculiar vibrating feel, her head is easy, she has no heat, little thirst, and is without cough. The mucous secretion does not increase, though the soreness is extended to the root of the tongue. The catamenia, which had begun to flow this morning, have ceased. Her bowels have been again opened. If the headache return, or the soreness in the throat increase, let an

enema be injected. To continue her powders, and to take milk freely.

Saturday, 9 *a. m.* (fifth day.) Pulse 104 and soft; there is neither thirst nor headache complained of; the skin is cool.

The pain on deglutition, and the ptyalism as usual; but the former is complained of chiefly after sleep. The night was passed comfortably.

The dressings were removed, and the following appearances were noted down. The wound is very extensive, and covered in its upper portion with a dark coloured mucous matter, which adheres to it. There is also some dark coloured coagulated blood oozing from several points. The lower half of the wound is not at all granulating, but of a palish ash colour, and the skin in some parts of its edge vesicatory. The discharge is considerable and watery.

Dry lint was applied, and the patient was ordered to take wine or porter in small quantities, in addition to her milk and broth.

R. Decoct: cinchonæ lancif: f. ℥vij.
Tinct: cinch. Comp: f. ʒss.
Acid: Sulph: dilut: f. ʒj.
Tinct: Opii *m* xl. M. Capiat cochl. ij quartâ quâque horâ.

Vespere.—Skin cool, pulse 100. She has taken broth, milk, &c. and a small quantity of wine; but the pulse having risen it has been omitted. The bowels have not been moved since this morning's visit; a purging powder was therefore given, and the bark and wine discontinued till the bowels were opened.

Sunday, 10 *a. m.* (sixth day.) Pulse 98 and soft, the skin cool, no headache or thirst, and the difficulty in swallowing abated. About three o'clock she awoke from a dream, and was much agitated; her pulse was then very quick, and the throbbing in the head very violent, with acute pain; but in half an hour she again slept, and passed the remainder of the night comfortably. There is some sensation in the cheek, and the warmth has been always natural. Her bowels have not been opened.

The upper surface of the wound is sloughy, the lower part

granulating. but the granulations are very pale. A slough also lines the orifice, which passes to the artery.

Monday, 10 *a. m.* (seventh day.) The patient has passed a good night, the pulse is 100 and soft, and she is free from thirst or fever. Her appetite is good, and she takes plentifully of milk, pottage, and broth. A motion was yesterday procured by an enema, she had another this morning. The secretion of mucus and the pain on swallowing are abated. There is some deficiency of saliva, the mouth being generally dry after sleeping. The discharge is partly puriform, but there is a very copious flow of saliva from the submaxillary gland. The slough is thinner, having here and there points of granulation rising through it, in one place the size of a sixpence. In the neck the granulations are pale, but there is a disposition to cicatrize on the posterior edge, where the mastoid muscle passes. The pulsation in the right carotid extends to the left side, and that of the left subclavian seems to be communicated to the vessel which has been tied, and excites suspicions of its being still pervious.

Tuesday, 9 *a. m.* (eighth day.) The sloughs continue to separate, and the granulating surface is less pale. The discharge is copious, and from the neck puriform. There is also some discharge from the orifice through which the ligature passes to the artery, but it is very healthy, and the slough lining it has separated. The last ligature on the small vessels also came away this morning. The patient passed a good night, and her strength increases.

Wednesday. She was restless till one *a. m.* but her bowels were then moved, and she afterwards slept comfortably, yet is not so well this morning. Her pulse 110 and irritable. Her appetite fails, having a dislike to any thing but gruel; yet her tongue is clean, her skin moist, her bowels have been again opened, and the discharge is natural. She had yesterday some throbbing near the ligature, but to-day the wound is easy. The ulcer on the neck contracts rapidly, the granulations, though pale, being healthy; but in the upper part, covering the cheek, the surface is glassy and irritable, with streaks of vessels running over it. The sloughs are mostly separated, except one, the size of a shilling, below the ear; and another in the deepest

part of the wound, at the lower edge of the submaxillary gland. The flow of saliva from this part is very great; below it, the discharge is healthy, but upon the cheek glutinous. A very little healthy pus may be pressed out of the orifice through which the ligature passes, but the granulations are rapidly closing around it, and it is now a mere fistulous opening. Dry lint was applied to absorb the moisture, and over it adhesive plasters.

I visited her again this evening, and found her pulse 104 and softer. The perspirations have been considerable, and the bowels again moved naturally. She was directed to eat ripe fruit, and omit the wine.

Thursday (the tenth day.) The following report was collected at this morning's visit. The patient passed a good night,—her appetite is returned, and her pulse early this morning 94. The wound looks much better, and contracts rapidly; the upper portion beginning to heal, particularly near the ear.

Friday. Much as yesterday, in all respects going on well. The pulse 102. She has been allowed to sit up, the last three days takes food well, her bowels regular and the discharge puriform. The ligature has risen considerably out of the wound.

Saturday (eleventh day.) The ligature came away this morning, without the smallest hæmorrhage; her pulse is 92 and soft. She slept well after midnight; her appetite is excellent, bowels regular, and the wound healing rapidly.

Sunday (twelfth day.) Much as yesterday, pulse 92. She sat up an hour yesterday without fatigue, and slept well.

Tuesday (fourteenth day.) The pulse yesterday morning, in consequence of being agitated, 108 and irregular; to-day it is only 82, soft and regular. The patient improves progressively, but the granulations rise above the surface, and there has been a large secretion of saliva: the surface was therefore occasionally washed with a solution of the nitrate of silver, which has repressed both these inconveniences. The wound leading to the artery is entirely filled up. The general health is good, and on the seventeenth day after the operation she sat up three hours without fatigue.

It is unnecessary to occupy the time of the society by a fur-

ther detail of her advancement towards a complete recovery. In ten weeks the wound was healed; but the granulations were never florid or pointed, and the secretion of saliva was long considerable, though it did not appear to retard the cicatrization of the ulcer. There has been no symptom of a return of this formidable tumor.

I cannot close my account without calling the attention of the society to the improvement which this branch of surgery is likely to derive from this operation, for the extirpation of any tumor behind the jaw, which is not connected deeper than the muscles attached to the styloid process, may with safety be removed by it, and very few instances of disease here have a deeper origin. The surgeon cannot however be too cautious, that neither the larynx nor pharynx are attached to it.

I know of no case, where the disease was at all comparable in extent, with a similar result. The rapidity of the growth of the tumor shows its extreme vascularity, and the flow of blood was so considerable, even with the carotid tied, as to convince me, if the subject had previously admitted of a doubt, that the most dextrous operator could not have completed it without that preparatory step.* It was not merely the security which was thus afforded to the operator, but the chance of the tumor being reproduced was also lessened; for if any portion of the diseased structure escaped observation, by cutting off so directly the flow of blood, there was great reason to conclude it would die from mere exposure. I hailed the sloughing surface, therefore, as a favourable circumstance, whilst it did not extend too deep; for there could be no hesitation in attributing it to the right cause, as the constitutional symptoms were mild. The vesicatory tendency in the skin along the edges of the wound, though partial, in all likelihood depended on some portion being left to cover the wound, which had been previously weakened by disease, and shows that the parts must be healthy to recover from so direct a privation. The sphacela-

* In a similar case, especially if the tumor were well defined, the operation would be much simplified, if, instead of tying the artery, the surgeon were to cut down upon, and command the current of blood through it, by an assistant pressing it either upon the vertebræ, or between his finger and thumb, until the tumor were removed, and the divided branches secured.

tion of the skin over aneurismal tumors, after the operation, is no doubt owing to the same cause.

A question would arise from this view, as to the propriety of merely performing the preparatory operation, and leaving the diseased mass to slough away. But it appears to me unadviseable, since the sloughing of so large a substance would produce more constitutional derangement than its removal by the knife, and retard, if it would not prevent, the adhesion of the arterial coats.

I do not dwell on the additional confidence which is now afforded, in tying the principal blood vessels, where there has been no obstruction to the circulation; for though a point of much practical importance, there is already a thorough conviction of its necessity and propriety; and for this conviction we are indebted to Mr. Abernethy, and other surgeons of the present day.

But these operations, always delicate, may be much facilitated by improvement in the instruments with which they are performed. The great variety used, shows that none of them are well calculated for accomplishing the principal objects of the operation. For if strong enough to be directed and passed under the vessel, the instrument has to be turned in the wound, and the property which rendered it valuable in the first stage of the operation, becomes now a great disadvantage. I am happy to present an instrument invented by Mr. Jordan, possessing both these properties, by a contrivance which displays great ingenuity. The following is an extract from Mr. Jordan's letter, explanatory of it; which, with a needle on his principle, I beg leave to submit to this society.

"When an aneurismal needle is passed under an artery and turned in the wound, the length of the needle is the diameter of a circle, a segment of which must be formed, or the parts forced from their natural position; and although the diameter may be diminished by increasing the curve of the instrument, to do this with the common aneurismal needle, requires more force than it is desirable to use. When the instrument is passed under the vessel, its shaft is worse than useless, but if we could convert the shaft into an elastic substance, its flexibility

would render the turning of the instrument easy; with this view I have formed the inclosed needle.

"Cut off about five-sixths of the shaft of a common aneurismal needle, and to the curved portion join a piece of elastic steel of a convenient length, in the upper part of which is an eye for the passage of the ligature. To give this the necessary firmness, I have a small silver sheath, which slides upon the steel and covers it, except at the superior part where the eye is formed. This sheath opens laterally, and may be taken off when the firmness of the needle is no longer necessary."

A Case of Incontinence of Urine, of nine years duration, cured by External Pressure. By John Hyslop, Esq.

[From the Medico-Chirurgical Transactions, Vol. VI.]

The patient was a young gentleman of 13 years of age, who had been subject to incontinence of urine for nine years, during which time he never passed a single day, without several involuntary discharges of his urine, and even during the night the same unfortunate and involuntary evacuation constantly took place.

In consequence of this, his life became truly uncomfortable. He had to submit to pain from inflammation coming on in the neighbouring parts, and from consequent excoriations; and he suffered much from the disagreeable urinary effluvia which constantly passed by evaporation from his clothes and from his bed.

But that was not all the evil which arose from this distressing state. He had to bear up in his mind under shame and vexation; the trying to hide what could not be concealed, gave him unavailing anxiety; and the sneers of his play-fellows and of servants, were, he has often told me, almost insupportable. He was even refused admittance into boarding-schools; and a shyness of manners, with a wish for solitude and retirement, gradually came on, and most likely had entirely changed, or greatly subdued the energy of his mind.

Many physicians and surgeons had been consulted, and various were the means employed. Tonics, cold bathing, blisters, at one time to the sacrum, and at another to the perinæum, had been applied, and opiates, with a view to break in upon a habit which by degrees had become established, were fairly and freely tried, but without any success.

He was sent to London to be under my care, and as I could have him in my house, so as to be constantly near him, I determined to employ pressure. The jugum penis did not answer the purpose, because it strangulated the glans so much that it could not be endured for the necessary length of time. I was therefore obliged to have recourse to some invention of my own, and it consisted of the following simple apparatus.

I selected a bougie of a size large enough to fill his urethra, from which I cut about two and a half, or three inches. Having placed that on the outside of the under part of the penis on a line parallel to the canal, with its point projecting a short way beyond the glans to avoid as much as possible any pain from pressure, I passed straps of adhesive plaster around, (first at the point of the penis, and afterwards continuing strap after strap the length of the piece of bougie,) and pulled them so tight as to press the bougie close in upon the urethra, so that no space was left by which urine could pass.

This was done at ten o'clock at night, and at three o'clock he called me out of bed, having a great desire to pass urine. I removed the straps, &c. and when he had emptied his bladder, I applied others in the same manner. The next desire for this evacuation was about seven o'clock, and the next again at eleven o'clock in the forenoon. After each evacuation the pressure was renewed without any unpleasant symptom, and in three days he was cured of incontinence of urine.

How far such treatment might answer the purpose of cleanliness and convenience, in paralysis, I have as yet had no experience, but when a case of that kind comes under my care, I shall not hesitate in giving it a trial.

A Case of Aneurism by Anastomosis in the Left Orbit, cured by Tying the common Trunk of the left Carotid Artery. By WILLIAM DALRYMPLE, Surgeon to the Norfolk and Norwich Hospital, and to the Norfolk Lunatic Asylum.

[From the Medico-Chirurgical Transactions, Vol. VI.]

ON the 24th of November, 1812, Dinah Field, aged 44 years, of a delicate and sickly habit of body, came to me with a complaint in the left eye. She said that about five months since, being then pregnant of her sixth child, she was seized in the middle of the night ,with an intense pain in the left eyeball, accompanied by a whizzing noise in her head, which grievously distressed her. "The attack was sudden, instantaneous." That, "hearing a noise as of the cracking of a whip, and feeling at the same moment an extraordinary kind of pain in the globe of the left eye, she awoke in great alarm, and leaped out of bed." About ten or twelve hours afterwards the eye became inflamed, and the eyelids so much swelled, as to project considerably beyond the level of the upper and lower orbitary ridges. She also felt acute pain over the whole of the left side of the head; and in the left eyebrow, and at the bottom of the orbit, her anguish was scarcely to be borne. In the succeeding night the extreme violence of the pain abated, but the swelling of the eyelids seemed rather to increase; and she thought she felt as if "the globe of the eye was forcibly driven upwards towards her forehead." No particular alteration took place in the next seven weeks, at the end of which she was delivered.

During her labour, which she said was very severe, there was projected between the eyelids a bright red tumor of an oblong form, which for seven or eight days gradually enlarged, until it occupied, in a vertical direction, almost the whole space between the superciliary ridge and the lower edge of the ala nasi; reaching horizontally from the external angle of the left eye, across the root of the nose, to nearly the internal canthus of the right eye. In the course of her confinement, this tumor was punctured in several places by a surgeon who then

attended her. It bled freely, became smaller, and of "a strikingly darker colour." A week afterwards it was again punctured, and with similar results; and although the operation was repeated four other times, the latter incisions afforded no relief.

About two months previous to the appearance of this swelling, the patient lost all power over the levator muscle of the superior palpebra: but if the swelling was depressed and the upper eyelid raised, she said she could see as well as ever. She soon afterwards became totally blind on this side.

Such was her case, and such her appearance, when I first saw her on the 24th of November. She was then only a week under my care, and ceased to be so from the end of November till the middle of March, a period of three or four months. When she again became my patient her general health had sensibly declined; and her condition was very wretched. The local affection was also marked by very decided characters. It was distinctly ANEURISMAL. Her pain was constant and acute, and chiefly referred to the bottom of the orbit; but her severest suffering was occasioned by an unceasing noise in her head, which she compared to the "rippling of water," and said "that it became absolutely insupportable whenever by any accident her head fell below a certain level."

The left eyeball was immoveable; and either enlarged, or thrust with so much force against the upper eyelid, as to cause this part to project in a convex form, considerably beyond the superciliary and infra-orbitary ridges. The eyebrow also of the affected side rose somewhat above the range of that of the opposite side. The external surface of the tumid eyelid was for the most part soft and elastic to the touch, but its cuticle was remarkably coarse, as was, indeed, the texture of the skin generally in the vicinity of the orbit. Deep seated between the integuments of the eyelid, a little towards the inner canthus of the eye, there was a cluster of small tumors of a firm and dense structure, causing great pain when compressed, and communicating to the finger a pulsatory thrill. Interposed between this cluster and the lower edge of the eyebrow, precisely in the course of the frontal branch of the ophthalmic artery, there was a hard tubercular substance, which rose somewhat

higher above the general surface of the eyelid, and pulsated still more distinctly than the smaller swellings. The texture of this substance was particularly hard and compact, the slightest pressure upon it occasioned intolerable pain. The lower eyelid was averted, and formed a bright red convex tumor, following, in its outline, the direction of the inferior edge of the orbit, and reaching from the external commissure of the eyelids a little way beyond the tendon of the orbicularis muscle. At its upper part it was covered by an overlapping of the upper eyelid, which was paralytic, and entirely concealed the globe of the eye. The most depending point of this tumor reached to within a line of the sub-orbiter foramen. Like the tumors at the upper part of the orbit, this swelling communicated to the touch an aneurismal thrill, which also became evident to the sight whenever the force of the circulation was increased. In addition to these appearances, immediately above the nasal third part of the superciliary ridge, the integuments were gently elevated into a soft ill defined tumor, occupying very exactly the situation of certain branches of the frontal artery, and pulsating simultaneously with the artery at the wrist. A similar elevation of the skin was perceptible at the root of the nose, giving a faint tremulous motion to a finger placed upon it. When the globe of the eye was uncovered, it appeared, at first, to be enlarged, but a closer inspection showed it to be forcibly thrust forwards, in a direction somewhat outwards and upwards towards the root of the orbit. A multitude of enlarged vessels might be traced from the surface of the lower tumor to that portion of the conjunctiva which covers the sclerotic coat of the eye. The cornea retained its natural lustre and transparency, but there was a total loss of power in the fibres of the iris; and the pupil, which was much dilated, had a slightly irregular figure. Behind the lens a fawn-coloured appearance was observed, similar to that which is represented in the second plate of the posthumous work of that admirable observer, Mr. Saunders. The cutaneous veins of the face generally were very full of blood, and gave to the skin of the whole of this side of the face, the complexion of a person strangled. When strong pressure was made upon the common carotid artery, the tremulous motions of the tumor situated at

the lower part of the orbit ceased entirely, but the pulsations of the upper swellings continued in some degree. The force of the stroke was, indeed, much weakened, but no pressure which the patient was able to bear could entirely suppress it.

Such is the exact description of this interesting case when it came a second time under my examination, and I could not fail to perceive in it the characters of that particular affection of arteries which, with perhaps a doubtful propriety, has been called "Aneurism by Anastomosis," as well as the closest resemblance to the case, which, with a master hand, has been described by Mr. Travers in the second volume of Medico Chirurgical Transactions.*

At noon, therefore, on the 7th of April, 1813, I tied the common trunk of the left carotid artery, in the presence of Dr. Wright, the late Dr. Reeve, Mr. Stevenson, and some other gentlemen.

The operation was performed after the manner adopted by Mr. Astley Cooper, in the case of Humphrey Humphreys, with a single deviation;† and its course was marked by the same circumstances which attended the operation of my distinguished friend. As soon as the margin of the mastoid muscle was raised, the descending nerve of the ninth pair was exposed to view, and when the sheath of the artery was laid open, the par vagum was seen at the outer side of the vessel. The jugular vein, pushed by the fore-finger of the left hand beneath the edge of the mastoid muscle, afforded no embarrassment. Nothing but the bare artery was included between the ligatures, which were formed of a small, but very strong *round* twine, and placed at the distance of about an inch and a quarter from each other. They were tied very firmly around the trunk of the artery, which was divided in the interspace, at the distance of about two thirds of an inch from the lower

* It would be difficult for me to over-state the assistance which I derived, in this case, from the excellent paper above mentioned: and I eagerly embrace this opportunity of acknowledging an obligation, the value of which can be appreciated only by those who may have been placed in situations of similar responsibility.

† This deviation consisted in omitting to pass the needle and thread through the artery, above one ligature and below the other.

thread. The edges of the wound were brought together by the common adhesive strapping; and the end of one of the ligatures was marked for the sake of subsequent observation.

The effects of the operation were immediate and decisive, As soon as the ligatures were tied, the pulsatory motions of the tumors on the forehead and cheek entirely ceased; but a slight thrilling was still perceptible in the tumid upper eyelid. The red swelling of the lower eyelid became paler, and its surface shrivelled. A few minutes after the patient was placed in bed, she was quite free from pain, and the noise by which she had been so long tormented having now also ceased, she declared to Mr. Stevenson, that "her head no longer felt like her old head."

At 5, *p. m.* there was no pulsation in any of the tumors. She had suffered a good deal of heavy pain at the hinder part of the head, but that had subsided, and she was calm and clear. —Pulse 102.

9, *p. m.* Some stiffness and difficulty in the act of swallowing, with restlessness and anxiety.—Pulse 104.

8th April, 7 *a. m.* Had passed a tranquil *night, though* with very little sleep.—Pulse 100 and soft.

1, *p. m.* Calm and easy, intellect perfectly clear. The upper eyelid, for the first time during several months, was moveable.

9th April, 7 *a. m.* Had passed a good night with much refreshing sleep. Pulse 100 and soft. The tumor over the inner part of the eyebrow entirely gone. The swelling of the upper eyelid was much smaller, its texture much softer, and it was less painful when compressed. The globe of the eye was also considerably retired within its orbit. At the wound all was quiet, but there was much difficulty in swallowing.

10 *p. m.* Had passed a tranquil day, and was very cheerful.

10th April, 7 *a. m.* An excellent night.—Pulse 98.

1 *p. m.* Bowels relieved.—Pulse 96.

11th and 12th April. Two excellent days and nights.—Pulse 84 and 80.

13th April, 10 *a. m.* Had passed an indifferent night, and was very unwell. The first dressings removed. The edges of the wound had united throughout their whole extent, except the extreme points where the ligatures were placed.

2 *p. m.* Two hours ago had a smart rigor, and was now become hot and thirsty.

9 *p. m.* Fever fit subsided.—Pulse 90 and soft.

14th April, 6 *a. m.* An easy night, with much refreshing sleep.

2 *p. m.* She was very unwell, complaining much, with a good deal of general commotion in the system.—Pulse 112 and hard. Sixteen ounces of blood were taken from the arm, and a purging mixture ordered.

5 *p. m.* Had been purged twice, and was now cool and easy.—Pulse 90, soft and flowing.

15th April, 8 *a. m.* Quite at ease. Great changes have taken place in the tumors. The globe of the eye was completely retired within its orbit, and the general prominence of the upper eyelid had sunk proportionably. Not the slightest pulsatory or thrilling motions were perceptible in any of the diseased parts.

15th, 16th, and 17th of April. Prosperous days. On the last day the patient got out of bed, for the first time.

18th April. The upper ligature came away upon the dressings this morning, being the eleventh since the operation.

From the 21st of April to the 3d of May, daily improving in health and strength.

4th May. During the last three or four days, the lower ligature had been gradually rising to the surface, and to-day it came away, followed by a large discharge, but unaccompanied by the slough of the artery.

7th May. Within the last two days loose luxuriant granulations had arisen at the extremities of the wound where the ligatures were inserted. These were treated with the nitrate of silver, but their growth was restrained with difficulty; and the quantity of matter was too large.

10th May. A smart fever fit to day, with pain and tension, and redness of the skin along the edges of the cicatrix.

12th May. A sinus had formed, and a considerable discharge of pus took place at the lower opening.

17th May. The loose spongy granulations having subsided, and the wound being nearly healed, the patient was this morning allowed to return to her family. From this period to the

3d of July, nothing material occurred. The tumors had all disappeared, and the patient's general health seemed re-established; yet the wound was not entirely closed. Pale, flabby granulations daily arose at the points where the ligatures were placed on the artery, and several small sinuses, forming in slow succession, occasioned much trouble. At length, on the evening of the 3d of July, I was called in great haste, in consequence of a bleeding which had taken place at the lower part of the wound. I went instantly; but the hæmorrhage had ceased before I could reach the house. The colour of the blood was florid, the quantity lost computed at ten or twelve ounces. This accident distressed me greatly, and produced so much commotion in the system of my poor patient, that the spongy substance which surrounded the little opening whence the blood had flowed, was forcibly propelled from the wound by every stroke of the heart.

A similar discharge took place on the evening of the 9th of July, which, like the former, ceased spontaneously; and happily proved the last of a series of incidents not unlikely to disappoint the hopes which the earlier circumstances of the case had inspired. From this period, however, the course of events was prosperous; and on the 19th of July, which, reckoning from the morning of the operation, comprises a period of 103 days, the wound was firmly healed, and the patient's recovery secured. Of her present state it only remains for me to observe, that, after a lapse of nearly two years, her cure appears complete, with the exception of her sight, which seems irrecoverably lost. Nor can I, at this period, entertain a fear of a recurrence of the disease, notwithstanding the apprehensions which, in reference to cases of this kind, have been felt and expressed by a great master of our art.

With respect to the state of the local circulation, as far as it can be known, there is no pulsation to be felt in any of the branches of the temporal and facial arteries on the side on which the ligature was tied. But, as in the case treated by Mr. Travers, "the artery may be distinguished beating very feebly below the angle of the jaw;" and a very brisk action of collateral branches, lying near the surface, is visible in the vicinity, and along the course of the cicatrix.

SELECTED REVIEWS.

Traité des Poisons, tirés des Règnes minéral, végétal, et animal; ou, Toxicologie générale considérée sous les Rapports de la Physiologie, de la Pathologie, et de la Médicine legale. Par M. P. ORFILA, Naturaliste Pensionnaire d'Espagne, Docteur en Medicine de la Faculté de Paris, Professeur de Chimie et de Physique; précédé du Rapport fait à la Classe des Sciences physiques et mathématiques de l'Institut de France.*

[From the Annals of Medicine and Surgery, for June, 1816.]

WE are anxious to give a connected view of the contents of this interesting work, which is now completed, and will be shortly translated into our own language.

The author in his preface, after descanting in no ordinary terms upon the importance of his subject, proceeds to state, that a general treatise on Toxicology, on a level with the present state of our knowledge, was altogether wanting to science. The truth of this remark cannot be denied, and the profession, as well as the public in general, are certainly much indebted to him for undertaking the laborious task of supplying this deficiency, which, by means of a zeal and perseverance seldom equalled, he has executed in a manner that reflects no inconsiderable honour upon himself. For if he has not completely succeeded, his failure must be attributed to the nature of his subject, and he has the merit at least of having approached perfection much more nearly than any of his predecessors.

M. Orfila defines a poison to be "a substance which taken

* The Eclectic Repertory for January 1816, contained a concise analysis of the first part of Orfila's Toxicology. We publish, however, in this number, a full and connected review of the whole work, as we are anxious to disseminate all the information that we can acquire on this interesting subject.

EDITORS.

inwardly *in a very small dose*, or applied in any kind of manner to the living body, depraves the health or entirely destroys life." This definition is perhaps exceptionable. The *quantity* of a substance requisite to act as a poison, it is obvious cannot be stated so as to be universally applicable, and had therefore better been left out of the definition. Our author seems to have been sensible of the imperfections of Fodéré's arrangement of poisonous substances,* which, with some slight variations, he has adopted. This arrangement is indeed very defective, though it is not perhaps possible, in the present state of our knowledge, to form upon similar principles a much better one, and certainly not one that shall be free from every objection. For our own parts, we prefer an artificial classification, founded upon external and obvious characters, to a pretended scientific one, founded often upon imaginary and hypothetical properties, which by assuming the appearance of instruction, too often misleads us; and it is in conformity with this *unphilosophical* taste of ours, that we should have rather chosen the old classification of poisonous substances into the mineral, vegetable and animal, with appropriate subdivisions, than that adopted by M. Orfila, in which they are attempted to be arranged into six classes, according to their supposed modes of operation, viz. 1. *Corrosive, or escharotic* poisons. 2. *Astringent* poisons. 3. *Acrid* poisons. 4. *Stupefying*, or *narcotic* poisons. 5. *Narcotico-acrid* poisons, and 6. *Septic*, or *putrefying* poisons. But as this arrangement did not originate with our author, perhaps it would be unfair to criticise it further, we shall therefore only observe, that in consequence of its imperfections, his general remarks upon each class are extremely defective. In treating however, of *particular* poisons, he has been much more successful. He first presents us with a minute and accurate account of the physical and chemical properties of the different poisonous substances, in which he not only states their action upon various re-agents, but also the effects they produce upon many of the constituent principles of the human body, and upon different articles used as food. He offers likewise many interesting and important examples of the

* See Traité de Médicine Légale par F. E. Fodéré, Tom. IV.

modes in which the action of tests upon poisons is modified when they are mixed with organized substances, and thus shows how cautious we ought to be in giving opinions from mere chemical evidences, when the poison is operated upon, as it frequently must be, in conjunction with the contents of the stomach, &c. We consider this in general as a valuable part of M. Orfila's work, and regret that he had not pursued this part of his subject further. The action of poisons upon the animal economy, when taken into the stomach, applied externally, or injected into the veins, is the next object of our author's enquiry, and under this head are related a great number of original and interesting experiments. We cannot, however, help thinking, that the modes of conducting many of these experiments were very exceptionable; thus, to prevent the substance being ejected by vomiting, the œsophagus was tied—an operation which alone, as M. Orfila himself confesses, generally proved fatal. Very little also can be learned of the real poisonous nature of a substance, by introducing it at once into the sanguiferous system, as the mildest and most innocent substance will generally prove fatal under these circumstances, whilst substances that act chemically upon the blood, from this very property alone, will speedily destroy life. These circumstances induce us to doubt the perfect legitimacy of some of our author's conclusions, as we shall note more particularly when we come to speak of the poisonous substances individually. Our author next proceeds to mention the nature of the symptoms produced by poisons, both as deduced from his own experiments detailed in the preceding sections, as well as from cases related by others; and to this account succeeds another, illustrating their destructive action upon the organization. The next point of view in which M. Orfila considers his subject, is a very important one, namely, the application of all the preceding facts to cases that may occur in juridical practice. These cases he considers as of four descriptions—first, the person may be living, and the remainder of the poison can be procured; secondly, the person may be living, but none of the poisonous substance, save what is voided by vomiting or stool, can be procured; thirdly, the person may be living, but no opportunity may be afforded of procuring any of the poison; and

fourthly, the person may be dead. In each of these cases, he describes the line of conduct to be adopted, and when it is possible, the best and most certain modes of detecting the nature of the poisonous substance. Lastly, he gives us the mode of treatment to be adopted in cases of poisoning by the different substances of which he treats, in which he points out the most effectual methods known of counteracting their deleterious effects, and concludes by an enquiry into the efficacy of their supposed antidotes.

After these general remarks, we come to consider the subject more in detail, and in doing this shall follow the arrangement adopted by our author.

Class I. *Corrosive* or *escharotic* poisons. Under this head are included the preparations of *Mercury*, *Arsenic*, *Antimony*, *Copper*, *Tin*, *Zinc*, *Silver*, *Gold*, *and Bismuth;* also the concentrated *Acids*, the *Caustic Alkalies*, and *Alkaline Earths*, *Glass*, and *Enamel* in powder, and lastly, *Cantharides*.

Mercurial poisons. Of these the most important is the corrosive sublimate or oxymuriate of mercury, on which our author therefore has very judiciously bestowed the greatest attention. The characteristic properties of this salt are, its solubility in water, alcohol, and ether; its being precipitated from its solution in water by carbonate of potash, of a deep brick-red colour; by pure potash, of a yellowish red colour, except when much diluted, when the precipitate is white; by lime water, in a moderate quantity, of a deepish yellow colour; by ammonia, white; by the hydrosulphurets, black; by the nitrate of silver, white, becoming black on exposure to light; by the triple prussiate of potash, white; by the hydriodate of potash (not mentioned by M. Orfila,) of a beautiful scarlet; by metallic mercury, white, &c. Heated with potash, it yields metallic mercury, as do likewise most of the above precipitates, on being heated with charcoal. By many vegetable substances, as gums, extracts, &c. this salt is converted into submuriate of mercury, or calomel, which is precipitated in union with a portion of the vegetable matter. The same is also true of many animal substances, as albumen, of the presence of which it is a very delicate test; likewise of some varieties of the ill-defined principle called *osmazome* by

the French chemists: also of bile, milk, broths from the gelatine they contain, &c.; it has moreover the property of corrugating and hardening fibrin. M. Orfila gives the *rationale* of all these phenomena as he proceeds, and afterwards points out some of the modes in which they are varied, when the poison is mixed with different substances; as for example, when this salt is mixed with Burgundy wine, it yields, on the addition of potash, a black precipitate; of ammonia, a deep green, bordering on black; of the prussiate of potash, a white, becoming violet, &c. These are most important observations, and ought to be generally known by all those who may be liable to be concerned in cases of poisoning. Our author next proceeds to consider the action of this poison when applied internally. Taken into the stomach in small doses, its effects are well known, and are such as to show beyond a doubt that it is absorbed into the system. In large doses, it seems capable of destroying life without being absorbed into the system, merely by the great disorganization it produces in that organ, and the shock necessarily given to the constitution by the injury. M. Orfila, however, seems to incline to the opinion of Mr. Brodie, whose experiments he relates, that in these instances it acts upon the brain and heart—simple inflammation of the stomach, according to him, being inadequate to produce the convulsive symptoms and speedy death occasioned by this poison; but after all, this only seems to be another mode of expressing the same thing, as the functions of the brain and heart are always affected by any violent injury done to an important organ, especially the stomach, a sudden blow upon which, without producing any evident disorganization, will instantly prove fatal. A very minute portion of this salt, artificially introduced into the sanguiferous system, destroys life; we do not however, agree with M. Lavort, quoted by our author, that this fact is sufficient to prove the non-absorption of it into the blood when applied to the stomach or surface of the body, as the circumstances in this case are very different, though we think it extremely probable that corrosive sublimate, *qua* corrosive sublimate, from its being so readily decomposed by animal matters, does not enter the sanguiferous system when applied in the above modes. From a variety of cases extracted

from different authors, M. Orfila states the symptoms produced by this poison to be

"An acrid, astringent, metallic taste in the mouth; a sensation of stricture and burning heat in the throat, anxiety, and rending pains in the stomach, and in the whole of the intestinal canal; nausea, frequent vomiting of a fluid sometimes bloody, accompanied with violent efforts, diarrhœa, sometimes dysentery; pulse small, hard, and frequent, lypothimia or great mental anxiety, general debility, difficulty of breathing, cold sweats, cramps in all the limbs, general insensibility, convulsions, death. The imprudent and continued use of this salt in small doses produces all the symptoms of which we have spoken in our examination of the action of the compositions of mercury on the animal economy."

This poison seems to act, as before observed, by producing general inflammation, &c. of the stomach and alimentary canal, but in the present state of our knowledge, M. Orfila confesses that it is impossible to point out in a precise manner the seat, extent, and character of the peculiar organic lesions which it produces.

Our author, according to the plan before mentioned, next comes to apply what he has before stated to practice. In the first case, when a portion of the poison can be obtained in its original state, its nature can be readily ascertained by the re-agents and methods formerly detailed. In the second case, when it can be only obtained in union with the alimentary matters, &c. it is by no means safe to trust to tests. The best mode of operating is now to mix a little of the suspected matter with caustic potash, and evaporate it in a porcelain or glass capsule to perfect dryness, and afterwards to heat it red hot in a small glass retort, fitted to a receiver. If mercury be present, it will be now found in a metallic state in the neck of the retort, often however, in such small quantity and in such a minute state of division, that it will be requisite to add a little nitric acid in order to take it up, in which state of combination its presence is easily detected by the re-agents, as in the former case. Many organic substances, as before stated, have the property of converting the oxymuriate of mercury into calomel, which, as is well known, becomes of a black colour on the ad-

dition of lime water. M. Chaussier therefore recommends us to digest the suspected substances in lime water; but our author has shown that this method is not to be trusted, because the black colour indicating the decomposition of the calomel is often not produced when this salt is in union with organic matters, either by lime-water or by potash, and M. Orfila has been often able to detect the presence of mercury by the method first mentioned, when the latter did not indicate its presence. In the third case, or where none of the poisonous substance can be procured, its nature of course can only be guessed at from the symptoms, the general circumstances of the case, &c. And in the fourth case, when the patient is dead, the contents of the stomach are to be collected and examined in the mode above mentioned; even the substance of these organs themselves should be examined, as the oxymuriate of mercury has been proved by our author to combine with them after death. Lastly, M. Orfila treats of the curative means to be adopted in cases of poisoning with this salt, and enquires into the efficacy of the substances which have been proposed by different authors as antidotes. On this part of the subject a number of curious and interesting experiments are related, which demonstrate the inefficacy of the alkaline salts and earths; the alkaline sulphurets, &c. proposed by M. Navier; also sulphuretted hydrogen, sugar, *infusum cinchonæ*, metallic mercury, &c. proposed by Duval and others. Albumen is the substance of all others which our author found most effective in counteracting the effects of this virulent poison, and he recommends that the patient should swallow as soon as possible several glasses of white of egg beat up with water; or if this substance cannot be procured, a decoction of linseed, marshmallow, &c. or even common water of the animal temperature, all which have the advantage, by encouraging vomiting, of being likely to expel the poison, and at the same time to moderate the irritation already produced. To prevent the effects of inflammation after this poison, bleeding, either topical or general, or both, will be often found necessary; and besides these, such other means must be had recourse to, as the peculiar symptoms may appear to indicate, and for which general rules can hardly be given. Our author next proceeds to treat of other preparations of

mercury, as the red oxide, the turbith mineral, or subsulphate, the nitrate, &c.; but as poisoning with these can very rarely happen, and as the mode of detecting them, their effects upon the system, &c. correspond with those already related, we refer to what has been said on the subject. He concludes by relating the effects of mercurial vapors, and states the result of several experiments, and quotes several authors to prove, that mercury, in the metallic state, exerts no action on the animal economy. He supposes that in those instances in which effects have followed its use in this state, it must have been oxidized —a circumstance easy to be accounted for from the minute state of division to which it was necessarily subjected.

Arsenical Poisons. M. Orfila justly observes, that "the preparations of arsenic are of all poisonous substances in the mineral kingdom, the most fatal, and are those with the properties of which the physicians ought to be best acquainted." He enters upon his subject as usual, by giving a minute account of the physical and chemical properties of this substance in its metallic state, in which state it does not appear to act as a poison. The most common form in which this metal is met with, and in which it is most generally used as a poison, is that of arsenious acid, or white oxide. The characteristic properties of this substance are, that on its being thrown on burning coals, it volatilizes and diffuses dense white vapors, having a strong garlicky smell. One thousand parts of water at a mean temperature, dissolve, according to Klaproth, about two and a half, and at a boiling temperature, about seventy-seven and a quarter; it is soluble also in alcohol and oils. In its aqueous solution, lime water produces a white precipitate; sulphuretted hydrogen and hydro-sulphuretted water, a golden yellow precipitate, as do also the hydro-sulphurets on the addition of an acid. Nitrate of silver produces a yellow precipitate, which becomes brown on exposure to light. The salts of copper, and especially the sulphate of ammoniacal copper, a fine green precipitate. The prussiate of potash, no precipitate. Albumen, gelatine, the sugar of milk, the resin of bile, &c. no precipitate. The arsenious acid, as well as the above precipitates, mixed with their own bulk of charcoal and potash, are easily revived by heat, and give out metallic arsenic. Many of the above re-

sults are considerably modified and changed, by mixture with organic products and substances commonly taken as aliments, for the details of which, we must refer to the work itself, as by extracting partial facts, we can by no means do justice to our author on this point. The nature of the action of this poison upon the animal economy is very obscure, and our author, after detailing Mr. Brodie's experiments, and seeming to object to the conclusions drawn by that gentleman, offers after all, very similar ones. It evidently exerts little apparent chemical action on organized products in general, and its influence on the animal economy, is often not evident till some time after it has been taken into the stomach. Symptoms of inflammation of this organ indeed, as well as of the intestines, occur, but these are generally of such a description, as to be apparently inadequate to account for the fatal effects which so constantly follow; and in short, we confess ourselves dissatisfied with every attempt to explain these effects, except the general one, that this metal is capable of inducing death by its deleterious action upon the nervous system.

From the cases detailed by our author, he concludes generally, that the symptoms induced by this poison, are as follow:

"An austere taste, fetid mouth, frequent ptyalism, continual inclination to spit, constriction of the pharynx and œsophagus, the teeth set on edge, hiccup, nausea, vomiting of a matter sometimes brown, sometimes bloody; anxiety, frequent faintings, heat of the *præcordia*, inflammation of the lips, tongue, palate, throat and œsophagus; the stomach painful to such a degree, as to be unable to support the most emollient drink, the alvine discharge blackish and very fœtid; pulse small, frequent and irregular, sometimes slow and unequal; palpitation of the heart, syncope, unquenchable thirst, pungent heat all over the body, sensation as of a devouring fire; sometimes an icy coldness, breathing difficult, cold sweats, urine scanty, red and bloody, change of the features of the countenance, a livid circle round the eyelids, swelling and itching over the whole body, which is covered with livid spots, and sometimes with miliary eruption, prostration of strength, loss of feeling, particularly in the feet and hands, delirium, convulsions, often

accompanied with an insupportable priapism, falling off of the hair, detachment of the epidermis, and lastly death."

As before observed, there are generally marks of inflammation to be observed after death in the stomach and other viscera of a person poisoned by arsenic, but these are generally insufficient to account for that fatal event. In applying what has been said to practice, in each of the four cases before mentioned, it will be easy in the first of these, or where a portion of the poison can be obtained, to ascertain its nature by the means formerly described. In the second case, or where the poison is mixed with alimentary substances, if the quantity of these be small, they may be evaporated to dryness, mixed with potash and charcoal, and the arsenic revived; but if the quantity be large, M. Orfila recommends them to be mixed with excess of hydro-sulphuret of ammonia, and the yellow precipitate thus obtained to be revived in the same manner as before. In the third case, where none of the poison can be obtained, information of its nature can of course be only derived from the concomitant circumstances; and in the fourth case, when the patient is dead, our author gives us in detail the methods of Hahnemann, Rose, Roloff, and Fischer, for detecting this poison. He objects, however, more or less to all these, and recommends another method of his own, which he considers as combining the advantages of the former methods, without their defects. This consists in boiling the contents of the stomach, and even in doubtful cases the stomach itself, in distilled water, testing this as before advised, and if arsenic be suspected, to collect the whole of it by adding hydro-sulphuret of ammonia, and reviving the yellow sulphuret formed in the manner just recommended. In short, the only safe way in cases of poisoning by arsenic is, if possible, to obtain it in the metallic state. Our author confirms the important observations of Mr. Brodie, that this metal can often not be detected in the stomach or intestines after death, the whole being ejected by vomiting. This shows the necessity of examining the matters thus thrown out.

M. Orfila now comes to consider the method of treatment to be adopted in cases of poisoning by arsenic. He relates the

results of his experiments made with the view of ascertaining the powers of the different substances, alleged to be antidotes to this poison, such as the alkaline sulphurets, sulphuretted hydrogen, different fatty substances, lime-water with milk, theriaca, &c. all which he proves to be quite inefficacious, and some of them even dangerous. He recommends the administering of large quantities of tepid water, milk, decoctions of linseed, &c., and the production of vomiting by tickling the throat with a feather, &c. Should inflammation afterwards take place, the usual means must be had recourse to, and as the subsequent state of convalescence is commonly long and painful, great attention must be paid to the regimen, &c. of the patient.

The poisonous properties of arsenic cannot be overcome by union with any known substance, and hence there is no proper antidote. Hence likewise, all its compounds act as poisons when taken into the stomach, but as the general properties, symptoms, &c. are the same as those above described, the same modes of detecting them, and of averting their deleterious effects, are to be adopted. Arsenic also inhaled in a state of vapour into the lungs, sometimes proves instantly fatal, and at other times induces death slowly by *phthisis pulmonalis*.

Antimonial poisons. Antimony given in its metallic state, has been known to prove fatal, probably by becoming oxidized in the *primæ viæ*. The most common compound of this metal, and therefore the most likely to be taken, is the tartar emetic, or the tartrate of potash and antimony, and it is to this preparation that M. Orfila has chiefly confined his observations, most of which however, may be applied to all the preparations of this metal. This salt is soluble in water, and in this solution, sulphuretted hydrogen and the hydrosulphurets produce an orange yellow precipitate when employed in small quantities, and a deep brown red if employed in excess. Concentrated sulphuric acid produces a white precipitate; lime-water and barytic-water, a white precipitate, both which are soluble in acids. The alkaline sulphates produce no precipitate; the carbonate of soda a white precipitate. Most vegetable juices and extracts produce precipitates, often of a reddish yellow colour; the tincture of galls, however, is one of the most delicate tests

of this substance, the precipitate produced is curdled and of a dirty white colour, inclining to yellow. Albumen, gelatine milk, broths, &c. do not affect a solution of this salt, though wine and many other substances mixed with it, so modify the action of the above tests, that it is impossible to recognize it by their means. Thus, when mixed with wine, the hydro-sulphurets produce first a reddish yellow, and then a green and even a black precipitate; infusion of galls, a violet precipitate, &c. This salt is decomposed by heat, and yields metallic antimony and potash. All the above precipitates can likewise be easily reduced by calcination with potash and charcoal.

M. Orfila next inquires into the poisonous properties of this salt. In small doses it proves its own antidote, by producing vomiting. Six or eight grains injected into the veins of a full grown dog, induce vomiting, frequent stools, difficulty of breathing, and finally death, commonly within an hour after the operation. After death, the lungs are found of an orange or violet colour, distended with blood, &c. and the mucous membrane of the intestinal canal, from the cardia to the extremity of the rectum, is red and strongly injected. Twelve or eighteen grains injected in this manner, prove fatal in half an hour, whilst the animal will often survive four grains for twenty-four hours; and in the latter case, the same appearances of the lungs and intestines are produced, whilst in the former, the lungs only are affected. What is singular, precisely the same appearances are found if this salt be taken into the stomach, or applied to an absorbing surface. Hence our author concludes with M. Magendie, that this salt produces death by being absorbed into the mass of blood, rather than by its direct influence on the stomach. The general symptoms produced by this poison are,

"A rough metallic taste, nausea, copious vomitings, frequent hiccup, cardialgia, burning heat in the epigastric region, pains of the stomach, abdominal colic, inflation, copious stools, syncopes, small concentrated and accelerated pulse, skin cold, sometimes intense heat, breathing difficult, vertigoes, loss of sense, convulsive movements, very painful cramps in the legs, prostration of strength, death."

The organic lesions, as before observed, which pretty con-

stantly follow the cure of this poison, are inflammation, more or less extensive, of the lungs and mucous membrane of the digestive canal; the brain also has in some instances been found affected. In applying what has been said on this poison to practice, in the first case, or when the salt can be procured unmixed, its nature can be ascertained by the means already mentioned. In the second case, when it is obtained in mixture with alimentary matters, the best mode is to calcine them with an equal weight of black flux, by which means the metal will be obtained in its pure state, and the same method may be also adopted with the contents of the stomach obtained after death. It is probable, however, if the dose were small, that the whole of it might be absorbed, and thus none be discovered in either of these cases. In the treatment of persons poisoned by the salt, the author prefers the promoting of vomiting, by drinking largely of tepid water, tickling the fauces, oil, &c., to the substances used as antidotes, as the infusions of cinchona, nut-galls, &c. Though these, or even a strong infusion of tea or other astringent substance, may be given in case vomiting cannot be induced in a short time. The author however justly reprobates the use of earths, alkalies, alkaline sulphurets, &c., as tending rather to increase the irritation produced by the poison. In cases of violent and continued vomiting, opiates may be useful, and where inflammation has taken place, blood-letting, and the usual remedies employed in that case, may be had recourse to.

Most of the other preparations of antimony prove violently emetic, and act as poisons. Their nature may be ascertained by heating them with the black flux, and thus reviving the metal, while the general symptoms, mode of treatment, &c., differ in no respect from those recommended in cases of poisoning, by the tartar emetic. Persons exposed to the fumes of antimony, have been known to become affected with difficulty of breathing, cough, hæmoptysis, gripings, diarrhœa, &c., which if they continued for sufficient time, would undoubtedly prove fatal.

Cupreous Poisons. Copper in its metallic state, does not seem to possess any deleterious properties. The oxide and carbonate are both poisonous, and these are liable to be form-

ed by the contact of any acid or fatty matter with a copper vessel, especially if they are boiled in it, and afterwards suffered to cool and stand exposed for some time to the air. Verdegris however, is the most common preparation of this metal, whose poisonous effects we have to encounter. This substance is usually a compound of the acetate, subacetate, carbonate and oxide of copper. The characteristic properties of this substance, are its green colour and partial solubility in water. The hydrosulphurets throw down from this solution a black precipitate. Phosphorus and iron, on being put into it, become covered with metallic copper. Caustic potash and ammonia in small quantities, cause a green precipitate, but if they are added in excess, they re-dissolve it. Arsenious acid instantly produces a green precipitate. The chromate of potash a beautiful yellow one. The prussiate, a brown one. Tea produces a flaky reddish yellow precipitate. Albumen a bluish coloured precipitate. Gelatine, broth, &c. do not affect it; but if added in large quantity to milk, this fluid is coagulated. The action of these tests as usual, however, is considerably modified by various substances, as for example, red wine. A solution of verdegris in this fluid, yields a black precipitate with the hydrosulphurets; a brown with the prussiate of potash; and a dark grey or black with ammonia, which is not redissolved by an excess of the alkali. All these substances by charcoal and heat, yield metallic copper. A single grain of the acetate of copper injected into the jugular vein, proves fatal to dogs in ten or twelve minutes, and twelve or fifteen grains taken into the stomach, prove generally fatal to the same animal in less than three quarters of an hour. This poison does not seem to induce death by its immediate action upon the stomach and alimentary canal, but by being absorbed into the circulating mass, and thus acting upon the brain and nervous system, and perhaps also the lungs. The symptoms of poisoning by this salt are,

"An acrid styptic coppery taste in the mouth, parched and dry tongue, a sense of strangulation in the throat, coppery eructations, continual spitting, nausea, copious vomitings, or vain efforts to vomit; shooting pains in the stomach, which are often very severe; horrible gripes and frequent alvine evacua-

tions, sometimes bloody and blackish, with tenesmus and debility, the abdomen puffed up and painful, pulse small, irregular, hard and frequent, syncope, heat of skin, ardent thirst, difficulty of breathing, anxiety of the *præcordia*, cold sweats, scanty urine, violent head-ache, vertigoes, faintness, weakness in the limbs, cramps, convulsions and lastly, death."

In the stomach and intestines of those who have died from this poison, there are always marks of inflammation, and sometimes gangrene, if the unhappy victims have survived a sufficient length of time.

On applying what has been said of this substance to practice, there will be no difficulty of ascertaining the nature of the poison when it can be procured, from the enumeration of its properties before mentioned. When mixed with the alimentary matters, the best method undoubtedly is, to expose the whole to heat, and thus reduce the metal; if its quantity be very minute, it may be re-dissolved in nitric acid, and its properties ascertained by tests as before. The same remarks apply to substances taken from the stomach after death; and it will be even proper to calcine the inner coats of the stomach themselves, as M. Orfila often detected the presence of this metal by these means. The hydrogenated sulphurets of potash, lime, iron, &c. formerly recommended as antidotes, besides being too irritating, are likewise ineffectual, as are the alkaline and earthy salts, and the infusion of nutgalls. Of all substances known at present, sugar is one of the most effectual antidotes to this poison. The first care therefore, of the medical man called in to a case of poisoning by this substance, should be to administer large quantities of sugar, either in solution or otherwise, and if this cannot be procured, diluting and mild fluids, as broth, or even warm water should be administered, and vomiting encouraged by every possible means. When inflammation has taken place, the usual antiphlogistic remedies should be resorted to, and if convulsive effects follow, narcotics and anodynes may be administered with advantage.

Most of the other salts of copper, especially the sulphate, nitrate and muriate, likewise act as poisons. From what has been said, the mode of detecting these, the general plan of treatment, &c. will be easily understood.

Poisons from Tin. Tin in the metallic state is not poisonous. The muriate of tin is the only preparation of this metal which is likely to be swallowed by accident or design. The characteristic properties of this salt are, its solubility for the most part in water, which solution, on being dropt into a solution of the muriate of gold, commonly yields a beautiful purple precipitate. By the hydrosulphurets, a black precipitate is produced. By the precipitate of potash, a white precipitate often becoming blue. Infusion of tea, and tincture of nutgalls, produce a yellow precipitate. Burgundy wine, a violet one. Albumen, white; gelatine, white. Milk, even in a large quantity, is instantly curdled by a few drops of a solution of this salt. Human bile, yields flaky curds. This salt, even in very small quantity, proves instantly fatal on being injected into the veins of animals, and in small doses taken into the stomach it seems to produce death by being absorbed, and thus brought to act on the nervous system. In large doses, it produces death, by corroding and inflaming the stomach and intestines. The symptoms produced by this substance as enumerated by M. Orfila are,

"An austere, metallic, intolerable taste, a sensation of constriction in the throat, nausea, repeated vomitings, a sharp pain in the epigastric region, which in a short time extends to the other regions of the abdomen, copious evacuations of the bowels, slight difficulty of breathing, pulse small, hard and frequent, convulsive motions of the muscles of the extremities and face, sometimes paralysis, and generally death."

It is not possible to discover the nature of the poison from the inflammation, &c. of the stomach and intestines which it produces, as these phenomena exhibit nothing peculiar. If a portion of the salt can be procured, its nature may be ascertained by the foregoing properties; but if it be obtained in union with alimentary matters, the best mode will be as before, to reduce the salt to the metallic state by heat. M. Orfila recommends milk as a very effectual antidote to this poisonous substance. Hence the propriety of having recourse to this fluid, or in case it cannot be procured, to diluting mucilaginous liquors, in order to excite if possible, vomiting. If inflam-

mation or distressing nervous symptoms follow, recourse must be had to the usual means of allaying them. Of the other preparations of tin, our author only mentions the oxide, which in large doses proves fatal to animals. Should a case of poisoning occur by this substance, the means to be adopted will be obvious from what has been said.

Poisons from Zinc. Zinc, or its simple oxide, does not appear to possess very deleterious properties. The sulphate is the most common, and perhaps the most active preparation of this metal; M. Orfila therefore, chiefly confines his observations to it. The sulphate of commerce almost always contains iron and sometimes copper; hence the colours of the precipitates usually vary, and are different from those obtained from the salt in its pure state. The following observations apply to the salt as usually met with in commerce. It is soluble in water. Potash and ammonia precipitate from this solution an oxide of a greenish white colour, easily soluble in excess of alkali. Prussiate of potash, often a precipitate of a bluish colour; the hydrosulphurets usually a blackish precipitate from the iron present. The chromate of potash, an orange yellow. Infusion of galls and tea, a deep violet blue precipitate, likewise from the iron present. Burgundy wine, no precipitate. Gelatine, a few flakes of a yellowish white; albumen, a white precipitate. Milk is curdled by it, if added in sufficient quantity. Human bile produces a few flakes of a yellow colour. Injected into the veins, it seems to produce death, by its action upon the brain and lungs. If taken into the stomach, it instantly produces vomiting, and is thus rejected; but if retained, it seems capable of inducing death, by exciting inflammation and its consequences. The symptoms produce by this poison, according to M. Orfila, are,

"An astringent taste, sense of strangulation, nausea, copious vomitings, frequent stools, pains in the epigastric region, extending afterwards over the whole abdomen, difficulty of breathing, frequency of pulse, paleness of the countenance, and coldness of the extremities."

In cases of larger doses of this salt being taken, the physician should always, as M. Orfila observes, keep in view its power-

ful emetic properties, which he should endeavour to promote by the exhibition of warm water and emollient drinks.—As an antidote, milk is recommended as the best. In cases of inflammation produced by this salt, the usual means must be resorted to.

Poisons from Silver. Pure silver, or its oxide, does not appear to possess poisonous qualities. The most active preparation of this metal is the nitrate. A solution of this salt, of which the common lunar caustic is a familiar example, yields, on the addition of muriatic acid or any of the muriates, a white precipitate, which becomes black on exposure to light. Potash and lime produce a deep brown precipitate; the hydrosulphurets, a black one; the chromic acid, red; and the arsenious acid, yellow. Ammonia does not disturb it, and copper and phosphorus separate from it metallic silver. Dissolved in Burgundy wine, this fluid becomes slightly turbid, and acquires a violet colour. Muriatic acid still produces a white precipitate from this mixture; the hydrosulphurets, a greenish brown; the phosphate of soda instead of a yellow, a violet blue. Added in considerable quantity to infusion of tea, this salt produces a flaky deep red purple precipitate. In less quantity, the infusion is changed to a black, without any alteration in its transparency. It precipitates albumen copiously. It does not affect gelatine or milk, except added in considerable quantity. With bile, it produces an orange yellow precipitate; and with broth, a dense yellowish white one. Injected into the veins, the smallest quantity seems to prove fatal, apparently by its action upon the lungs and nervous system. Taken into the stomach in large doses, it seems capable of producing death, by destroying the texture of that organ. If the mucous membrane be not destroyed, it is rendered more or less red; but if the dose has been large, it will be found entirely destroyed, and the muscular coat very much inflamed and of a bright red colour, and sometimes all the coats of the stomach will be found perforated. Exhibited as a medicine in large doses, it generally produces severe vomiting and diarrhœa, with intense head ache, but these unpleasant symptoms may be obviated by combining it with opium. From the properties before mentioned of this salt, and its easy reduction, it may be

recognized without difficulty, even when in small quantity, and mixed with excrementitious matters. The best antidote to this salt is the muriate of soda. This may therefore be dissolved in small quantity in warm water, of which copious draughts may be administered frequently. Emollient drinks may be afterwards had recourse to, and the usual means employed, if inflammation should ensue.

Salts of Gold. Gold in its metallic state is not poisonous; but the muriate of this metal seems to exert very powerful action on the animal economy. It dissolves in water, and the solution is yellow, and stains the skin permanently purple. Ammonia precipitates it in reddish yellow flakes, which when dry fulminate violently by heat. Potash produces a brownish red precipitate. The prussiate of potash no precipitate. The hydrosulphurets, a deep chocolate precipitate. A solution of green sulphate of iron precipitates the gold in the metallic state. The muriate of tin produces a fine purple precipitate. Sugar produces no effect. Infusion of tea produces a reddish yellow precipitate. Mixed with Burgundy wine, a beautiful deep purple precipitate is produced, and the metal is partly reduced. Albumen produces a yellow precipitate: gelatine, a precipitate in yellow filaments. Milk is instantly coagulated by it. Human bile is precipitated green, which becomes purple. M. Orfila's experiments show, that a very small quantity of this salt injected into the sanguiferous system, proves fatal, apparently by its action on the lungs. Taken into the stomach in large doses, it likewise proves fatal, by producing inflammation of the stomach and intestines. No case of poisoning by this salt was known to M. Orfila, but if such should happen, the nature of the poison could be easily ascertained if it could be procured, by the above mentioned detail of its properties, and as no antidote is known, the usual means, especially the production of vomiting, should be had recourse to. Some cases are related, which demonstrate the poisonous properties of the fulminating precipitate above mentioned.

Salts of Bismuth. All the compounds of this metal with oxygen, seem to be poisonous. M. Orfila confines himself, however, to the nitrate of bismuth; the properties of which are briefly as follow: It reddens litmus, and on being mixed with

a large portion of water, after some time a white precipitate, which is the subnitrate of bismuth, is produced. Sulphuretted hydrogen, and the hydrosulphurets, produce a black precipitate. The prussiate of potash, a pale yellow one. The chromate of potash, a beautiful orange yellow. Infusion of galls, and a strong infusion of tea, a pale flaky yellow precipitate. Mixed with Burgundy wine, a violet precipitate, more or less abundant according to the quantity added, is produced. Albumen, milk and human bile are precipitated by this salt, but gelatine is not affected by it. All these precipitates can be easily reduced, by exposing them to a strong heat with charcoal. Nitrate of bismuth injected into the veins seems to prove fatal, chiefly by acting on the lungs; taken into the stomach in large doses, it corrodes that organ, and at the same time seems to act upon the lungs. The symptoms produced are, the most distressing anxiety, nausea, vomiting, diarrhœa or constipation, colic, vertigoes, faintings, convulsions, and death. The nature of the poison, if it can be procured, can be easily discovered from the foregoing enumeration of its properties, and of the substances to be exhibited, "milk and sweet mucilaginous drinks deserve the preference."

The concentrated Acids. None of the acids in their dilute state, are perhaps to be strictly considered as poisons; but the three mineral acids, namely, the *sulphuric*, the *nitric*, and the *muriatic*, and perhaps also the *phosphoric*, in their concentrated form, may be classed among the most active and destructive agents known. A common property they possess, is that of changing vegetable blues to red. The characteristic properties of the sulphuric acid are, its great specific gravity, its forming with the barytes, and lead, very insoluble white compounds, and its yielding the smell of burning sulphur on being boiled with mercury. For nitric acid there is no single test that can be relied upon. But it may be easily discovered by combining it with any base, especially an alkali, and exposing the salt to a strong heat in contact with charcoal, when a vivid inflammation or detonation takes place. Heated also with charcoal, sulphur or phosphorus, or poured on copper filings, it is decomposed, and copious orange yellow vapours are given off. Muriatic acid may be known by its forming, on the addi-

tion of nitrate of silver, a dense white precipitate, which becomes of a deep purple or black on exposure to light, and by its yielding a suffocating greenish coloured gas (chlorine,) on being heated with the black oxide of manganese. Phosphoric acid yields phosphorus on being heated with charcoal, and forms white precipitates with lead, lime, and barytes, which are soluble in acids, and precipitable again by ammonia. Sulphuric and nitric acids render Burgundy wine of a lighter red; muriatic acid changes it to rather a deeper shade; and phosphoric acid does not affect it. Neither of them precipitate a solution of gelatine, but render it somewhat more transparent. They all instantly coagulate albumen,* milk, bile and blood. M. Orfila's experiments show that, injected into the veins of animals, even in small quantity, they instantly destroy life, apparently by coagulating the blood; that taken into the stomach, they speedily induce death, by totally disorganizing and destroying that viscus, and that if applied even externally to any extent, the animal either sinks under the first effects of the corrosion they occasion, or else from the copious suppuration which succeeds it. The symptoms they produce differ but little from one another, and are of the most terrible kind. The phosphoric, however, is the least active. A severe burning heat is felt in the mouth, œsophagus and stomach, the most distressing vomitings take place, of an acrid matter, sometimes as black as ink, sometimes solid, and at times mixed with blood. Pulse frequent, small, and often irregular; coldness of the skin, particularly of the legs and thighs, great tenderness of the abdomen, with severe gripes, and sometimes bloody stools, deglutition difficult or impossible, the countenance pale and expressive of the utmost anxiety, cold sweats, &c., and death. In some instances, however, when a large quantity of concentrated nitric acid has been taken, the pain has been less severe before death, and sometimes even from the beginning, which M. Tartra, quoted by our author, considers as an unfavourable circumstance, and as demonstrating the total disorganization and death of the affected parts. On

* It may however be proper to observe, that dilute phosphoric acid does not coagulate albumen.

examination after this event, the œsophagus and stomach are found inflamed, ulcerated and gangrenous, or where the sulphuric acid has been taken, reduced to a black jelly. The nitric acid usually gives the parts over which it has passed, a yellow or orange tinge. In general there can be little difficulty of ascertaining when these acids have been taken, and the peculiar nature of the acid may be easily learnt from the description of their characteristic properties before mentioned. Of all the antidotes, calcined magnesia, as recommended by M. Orfila, is undoubtedly the best; it may be given suspended in diluent and mucilaginous drinks. If this cannot be procured, a weak alkaline solution, or a strong solution of soap and water, may be used. Some have also recommended large doses of oil, or almonds. If the quantity taken has not been so large, but that hopes of recovery are entertained, emollient drinks and glysters, the warm bath, &c., may be had recourse to, in addition to the general means for obviating the effects of inflammation. The effects of the other mineral acids, as the nitrous, phosphorous, &c. are stated to be similar to the above mentioned, except those of the fluoric, which according to Thenard, "is of all bodies the most corrosive," and acts with such energy on the organic texture, that it would doubtless speedily induce death, even when applied externally.* Of the vegetable acids, the oxalic, since M. Orfila's work was published, has been found to act as a violent poison, and to prove speedily fatal to the human subject, in doses of less than an ounce. Ten grains were found by Mr. Robarts, to kill a healthy rabbit in five minutes, and a drachm proved fatal to a middle sized dog in ten minutes.† This acid may be known by its crystallizing in the form of four sided prisms, terminated by dihædral summits, and by the white precipitate it forms with lime water and all solutions of the salts of this earth, which precipitate is soluble in nitric acid. If we can rely upon the observations of Mr. Robarts, it seems to induce death, by sympathetically affecting the brain and heart, from the disorganization of the stomach which it produces. What

* See Traité de Chimie Elémentaire, tom. I.

† See the London Medical Repository, vol. iii. p. 380.

is singular, Mr. Robarts found evident traces of the acid in the blood. An antidote, which has been recommended by Mr. Thompson, is carbonate of lime; but calcined magnesia would be doubtless better, as the carbonic acid liberated from the chalk would be likely to prove distressing to the patient. Whether the tartaric and other vegetable acids act as poisons, we do not know, but we think it very probable, that in large doses and a concentrated form, they would prove equally so with the oxalic.

The caustic and carbonated Alkalies. Concentrated solutions of all the alkalies act very energetically on organized substances. They all change the vegetable blues to green. Potash may be distinguished by producing a brownish yellow precipitate with the muriate of platina, and a compound but little soluble in water with the tartaric acid, whilst soda does not possess these properties, at least not the first. Ammonia is readily distinguished by its peculiar odour and volatility. These alkalies form salts with the different acids, most of which are soluble in water. They change the colour of Burgundy wine to green, and do not precipitate gelatine, albumen, milk or bile, or coagulate the blood, but prevent the spontaneous coagulation of this fluid. Notwithstanding this property, however, M. Orfila found, that potash injected into the veins, coagulates this fluid, which is a remarkable fact. When thus injected they all prove speedily fatal. Taken into the stomach, potash and soda destroy life by inflaming, corroding and destroying this organ. Ammonia, according to our author, sometimes induces death in a similar manner, and sometimes by acting on the nervous system, and particularly the vertebral column. The symptoms produced by potash and soda, are "a styptic, urinous, and caustic taste, a severe burning in the throat, vomitings, sometimes of bloody alkaline matter, copious alvine evacuations, a most severe pain in the epigastrium, &c., and if taken in any quantity, death soon takes place."

The most common effects produced by the alkalies are, besides the usual effects of inflammation, perforations of the stomach. In cases of poisoning by them, there will be but little difficulty in detecting their general nature, and the particular

alkali may be easily distinguished, by attention to the above characteristic properties. The best antidote to the alkalies, according to M. Orfila, is vinegar diluted with much water, not only from its property of neutralizing their properties, but from its power of inducing vomiting. After the first symptoms are relieved, such means should be employed as are calculated to prevent or arrest inflammation of the abdominal viscera.

The alkaline Earths. Barytes and the carbonate and muriate of Barytes. This earth and both the compounds mentioned, prove active and virulent poisons. It may be readily distinguished in a state of solution, by the white insoluble precipitate which it forms on the addition of sulphuric acid or any sulphate, which precipitate does not assume a black colour on exposure to sulphuretted hydrogen. The alkaline sulphurets also, do not produce a change of colour in a solution of barytic salt. M. Orfila chiefly confines his observations to the muriate of barytes, the poisonous properties of which are best known. Burgundy wine, from the sulphates which it contains, is slightly affected by the muriate of barytes. It does not affect gelatine, albumen, or milk, but precipitates bile of a greenish yellow colour. Injected into the veins in very small quantity, it proves fatal; as it does when taken into the stomach, or applied externally to a wounded surface; and our author concludes from his own experiments and those of Mr. Brodie, which he relates, that this salt injected into the veins, produces death by acting on the nervous system, and coagulating the blood, and that when applied externally, or introduced into the stomach, it exerts its action likewise upon that system, after having been absorbed and carried into the current of the circulation. It produces moreover in these circumstances, inflammation of the texture with which it comes in contact. Mr. Brodie drew a similar conclusion from his experiments, namely, that it occasions death by acting upon the brain and heart. Our author knew no instance of poisoning from this earth, or its compounds, but observes, that should such an accident occur, the nature of the poison could be readily distinguished by the characteristic properties above enumerated. From the very little effect this earth appears to produce on the animal economy, when combined with sulphuric acid, a solution of

the sulphate of soda or magnesia, or some other soluble sulphate, is recommended as its best antidote. After which, vomiting may be excited. The subsequent treatment, of course, must vary with the nature of the symptoms. *Lime* in its pure state taken into the stomach, appears by M. Orfila's experiments, to prove fatal, by inducing inflammation of that organ. But as this accident is so little liable to occur, we think it quite unnecessary to enter into the detail of its properties and the symptoms it produces, which appear indeed to be nothing more than those of common inflammation. We are rather surprised that our author has not noticed the *muriate of lime*, which seems capable of producing poisonous effects on the animal economy, and is much more liable to be swallowed than *quick lime*.

Phosphorus. The wax-like appearance and easy inflammability of this substance, readily enable us to distinguish it from every other known. In its pure state it appears to exert no sensible action on gelatine, albumen, milk or bile, all of which like watery fluids in general, are incapable of dissolving it. Dissolved in oil of cloves, and injected into the veins, it is elicited from the lungs, according to M. Orfila, under the form of phosphorous acid, and speedily proves fatal. It is no less fatal when taken into the stomach in any considerable quantity. In the first case, violent inflammation of the lungs is produced, and in the last, similar inflammation of the stomach and intestines, apparently from the heat evolved during the combustion of the phosphorus, and perhaps also the irritating qualities of the concentrated acids formed by this combustion. Hence the symptoms produced by this substance, and the lesions of texture observed after death, very closely resemble those of common inflammation of the stomach and intestines. In cases of poisoning by phosphorus, there can be but little difficulty in discovering the nature of the poison, and M. Orfila recommends as the best step to be adopted, the speedy administration of an active emetic, with copious draughts of water holding magnesia in suspension, which will combine with any acid as fast as it may be formed, while the water will displace the atmospheric air, and thus prevent the further combustion of the phosphorus, and at the same time favour its ejection by vomiting.

Glass and enamel in Powder. Our author very naturally hesitates in ranking these substances among poisons. His own experiments and those of others which he relates, appear to show, that when they are in a state of very fine powder, they ordinarily produce no deleterious consequences; but if the fragments are large and angular, as might be naturally expected, the reverse is the consequence; but even in this case, the effects produced do not appear to be always so severe as might be supposed. In accidents of this kind, it is obvious that little can be done. If it has recently occurred, perhaps the best plan will be to distend the stomach with some pultaceous substance, and induce vomiting.

Cantharides. (*Lytta vesicatoria.*) M. Orfila, after describing this insect, relates its chemical properties, as ascertained by M. Robiquet. Not one of these, however, as is the case with most organized objects, affords such characteristic properties as will enable us to distinguish the substance in question, especially when in a state of solution. Such a solution injected into the veins, speedily proves fatal. Taken into the stomach also in any considerable quantity, these insects produce the most horrible symptoms, and in a very short time death itself; and M. Orfila's experiments and observations induce him to conclude, that when injected into the veins, their poison acts chiefly upon the nervous system, and especially the vertebral column; that taken into the stomach, it produces violent inflammation of that viscus, and also of the urinary organs, and appears to act likewise upon the nervous system; and lastly, that applied externally, it sometimes destroys animals by the same sort of action which it exerts when introduced into the stomach. The symptoms produced are stated by our author in the following manner:

"A most unpleasant and infectious (*infecte*) odour, a disagreeable and acrid taste, frequent nausea and vomiting, abundant and often bloody alvine evacuations, violent epigastralgia, most severe gripes and excruciating pains in the hypochondria, heat in the bladder, urine sometimes bloody, and obstinate and sometimes painful priapism, pulse frequent and hard, a very disagreeable sensation of heat and ardent thirst, some-

times a horror of liquids, frightful convulsions, tetanus, delirium, &c. &c."

The lesions of texture produced by these insects are, as before observed, violent inflammation and ulceration of the stomach and intestinal canal, and often of the urinary organs. If they have been administered in powder, the nature of the poison may be ascertained, by attentive examination, from the number of beautiful shining points of a fine green colour, derived from the external covering of the wings. When given in solution, we can only guess at the nature of the poison from the history of the case, and the symptoms. As to the treatment of those who have been poisoned by these insects, mild emetics, as oil, emulsions, &c. in large quantities are recommended, and to obviate the common symptoms of inflammation, the usual means must be resorted to—nothing like a specific remedy or antidote being known for this active and deleterious poison.

CLASS II. *Astringent Poisons.* In this class *Lead* stands alone. This metal, like most others, in its natural and uncombined state is not poisonous, but it readily combines with oxygen and acids, and in this state it exerts its baneful effects with the greatest energy. The most common preparations of this metal, and which are objects of commerce, are the acetate, or sugar of lead, the red oxide, or red lead, the yellow oxide, or litharge, and the carbonate, or white lead, the chemical properties of which are detailed at length by M. Orfila, but of which, according to our plan, we shall only notice those which are sufficient merely to enable any one acquainted with the common principles of chemistry to distinguish them.

The acetate of lead yields copious fumes of acetic acid, when sulphuric acid is poured upon it. It is soluble in water, and forms a dense white precipitate on the addition of an alkaline sulphate or carbonate; a black precipitate on the addition of sulphuretted hydrogen, or the hydroguretted sulphurets, and a fine yellow precipitate on the addition of chromate or hydriodate of potash. These precipitates on being exposed to a strong heat, with potash and charcoal, yield metallic lead. The acetate of lead precipitates Burgundy wine. It likewise

precipitates albumen, milk, and bile, also broth, but not gelatine. The red oxide of lead is known by its beautiful colour and density, and by its yielding, on being heated with charcoal, metallic lead. Litharge usually exists under the form of reddish or yellow scales, and likewise yields metallic lead on being heated with charcoal. White lead may be distinguished by its density, by its yielding carbonic acid on the addition of an acid, and more certainly by its yielding metallic lead on being subjected to heat with charcoal. Burgundy wine dissolves a considerable proportion of litharge, loses most of its colour, and acquires a sweetish taste, and from this state of solution the lead may be precipitated on the addition of the different substances before-mentioned, nearly in the same form. Wines, syrups, spirits, &c. often contain lead in solution. Distilled water, and very pure spring water, have likewise the property of dissolving this metal, a remarkable instance of which has lately occurred at Tunbridge Wells; and of which an account has been just published by Dr. Thomson. Many articles of food also, kept, and especially salted or cooked, in leaden vessels, are liable to become impregnated with this deleterious metal.* M. Orfila's experiments induce him to conclude, that the acetate of lead introduced into the circulation is not so energetic a poison as most of the other metallic salts, except in doses of several grains, when it is capable of producing violent symptoms, followed by death, more or less speedy; the cause of which appears to depend upon its action upon the nervous system. Taken into the stomach in a large dose in a solid form, it produces death in the course of a few hours, even when the animals are allowed to vomit; and that apparently in consequence of its inflaming and corroding the alimentary canal. Taken in a state of solution, in large quantity, its fatal effects seem to depend more upon its being absorbed, and then acting upon the nervous system. In small doses its action appears to be confined to the exciting of vomiting, and increasing the alvine discharges. The same effects take place from other

* It has also been said, that not only the subcarbonate of potash of commerce, but what have been sold even for pure potash and soda, have been lately found to contain lead.

preparations of lead. But by far the most common and terrible effects of this metal are produced when it is introduced for a long time together in small quantities into the constitution, and to which all those who have much to do with lead in any way are liable. These effects have been observed and known from the earliest times, and have acquired various names, of which perhaps the *lead colic* is the most appropriate. Their progress is sometimes rapid, but generally the reverse, and they commence with gripings, more or less severe, about the umbilicus; the abdomen retracts spasmodically, and becomes hard and knotty; there are often eructations, with nausea and vomiting; the most obstinate costiveness prevails, but no fever; and there is a tendency, especially in the latter stages, to paralysis of the extremities—a circumstance which we are surprised to find so little dwelt upon by M. Orfila. The preparations of lead, taken in large doses, as before mentioned, produce inflammation; but numerous dissections on record of those who have died from the lead colic, show that inflammation cannot be the cause of death in this disease: and according to M. Orfila, a contraction of the diameter of the great intestines, particularly of the colon, is the only thing observed; so that this metal seems to exert its baneful influence chiefly on the nervous system. M. Fodéré indeed says, that in those who die of this disease, the mesentery and its glands, with the chyliferous and lymphatic vessels, and other important viscera, are inflamed and obstructed, and thus appears to conclude, that it destroys life by inducing marasmus; but these circumstances are denied by our author. When a large portion of any preparation of lead has been swallowed, if any portion of it can be procured, its nature can be easily ascertained; but it is singular, that in those who die of lead colic, and by whom the poison has been slowly taken into the constitution, not a particle of lead, according to Barruel and Merat, as quoted by M. Orfila, can be detected in any part of the alimentary canal, or its contents. Our author next comes to speak of the antidotes to lead when in large doses, and observes that the alkaline sulphurets which have been recommended, are totally inefficient, as the sulphuret of lead formed is an active poison; and recommends the sulphuric acid, or an alkaline or earthy

sulphate, especially that of magnesia, as a much more effectual substitute, since the sulphate of lead appears to be comparatively an inert substance. In the lead colic, however, it is obvious that the treatment must be very different, and M. Orfila enters at great length into the mode of treating this disease. But we must confess, that the specimen he has given of the practice pursued in this disease, in the hospital called *La Charité* in Paris, does not impress us with very favourable notions of the state of medical science in that metropolis. We do not think it necessary to notice all the remedies that have been proposed in this disease, most of which are detailed by our author. It of course must be left to the judgment of the physician to apply particular remedies to particular indications, but in general the chief indications appear to be, to abate the spasmodic action, and to excite the action of the intestines; and it is very probable that in most instances the first of these indications will be fulfilled by attending to the second alone. As a purgative, the *oleum ricini* has been found particularly beneficial, and lately the nitrate of silver, in conjunction with this oil, or subsequently to its use, has been strongly recommended by Dr. Roberts.*

In an *Appendix* to this volume, the author relates experiments made with the newly-discovered substance called *iodine*. This may be readily distinguished by the beautiful purple vapour it forms on being exposed to a moderate heat. He concludes that it ought to be ranked among the *corrosive* poisons, and states the following as the results of his experiments—that in small doses it acts as a slight stimulant, and induces vomiting; that in larger doses, when it is not ejected by vomiting, it slowly produces ulcerations in the mucous membrane of the stomach, and ultimately death; but that if ejected by vomiting, no bad effects follow; lastly, that it does not destroy life when applied externally.

He also relates experiments made with a view of ascertaining the efficacy of some alleged antidotes that had been lately recommended in cases of poisoning with oxymuriate of mercury and arsenic; these are charcoal in powder and the hydroguretted sulphuret of potash, the inefficacy of both of which,

* See Medical Transactions of the College of Physicians, Vol. 5, p. 45.

especially of charcoal, he points out. He even shows that the sulphuret of potash is itself a poisonous substance, while most of the compounds of sulphur with poisonous metals have been stated to be so above.

Such are the contents of our author's first volume, which certainly will exhibit a lasting monument of his industry and labour; and if the results have not been so satisfactory as could be wished, still they are important, as he has undoubtedly thrown very considerable light upon the mode of action of some of the poisonous substances, as well as pointed out the efficacy of some unexpected substances, as antidotes. There is however, one fault which we think it our duty to mention. The author throughout has been a slave to method. Hence his work abounds with frivolous divisions and subdivisions, which, like so many "passages that lead to nothing," are not only useless, but often absurd. For besides the numerous tautologies which they occasion, they give an air of stiffness and formality to the book, which makes it very disagreeable to peruse, and which, we are convinced, will render it much less popular than it deserves to be.

We shall conclude this part of the subject, by recapitulating the more important general results in a tabular form.

POISONOUS SUBSTANCES.	ANTIDOTE, &c.
Oxymuriate of Mercury . . .	Albumen.
Arsenic	
Tartrate of Antimony and Potash	If vomiting cannot be induced, infusion of cinchona, or any other vegetable astringent infusion.
Verdigris and Sulphate of Copper	Sugar.
Muriate of Tin	Milk.
Sulphate of Zinc	Violent emetic. Vomiting to be encouraged by swallowing emollient liquids.
Nitrate of Silver	Solution of Muriate of Soda.
Muriate of Gold	
Nitrate of Bismuth	Milk and sweet mucilaginous liquids.
The Concentrated Acids	Calcined Magnesia.
The Caustic Alkalies	Vinegar, diluted with much water.
Barytes and Muriate of Barytes .	The Alkaline Sulphates, or Sulphate of Magnesia.
Phosphorus	
Cantharides	
Acetate of Lead	The Alkaline Sulphates, or Sulphate of Magnesia.

The second volume of this interesting work, which we now come to consider, was published upwards of a year after the first, and has not been very long in this country. In it the author has completed the plan he had in view. It commences with an account of his THIRD CLASS, or what he denominates the

Acrid Poisons. We formerly mentioned, that from the arrangement adopted by M. Orfila, his account of the properties which the different substances classed together by him possess in common, is very imperfect. This is particularly the case with most of the classes in this volume, and especially with the present class. Our author defines the *acrid poisons* to be those substances "which have more or less of a caustic taste, and which, applied to the surface of the body, excite inflammation, often accompanied by blisters and the destruction of the cuticle, and terminating in suppuration. Introduced into the stomach, they produce local affections, *very analogous to the corrosive poisons, notwithstanding,*" says our author, (evidently aware of the imperfections of the arrangement he has adopted) "*the opinions of many physiologists who have pretended to establish differences, founded upon the lesions which the organization presents after death.*"

The substances arranged by M. Orfila under this class, are chiefly taken from the vegetable kingdom. They are, *Veratrum album*, *Helleborus niger*, *Bryonia dioica*, *Momordica elaterium*, *Cucumis colocynthis*, *Gamboge*, or the gum resin obtained from the *Stalagmites cambogioides*, *Daphne gnidium*, *D. mezereum*, *Ricinus communis*, *Euphorbia officinarum*, *Juniperus sabina*, *Rhus radicans*, *R. toxicodendron*, *Anemone pulsatilla*, *Aconitum napellus*, *Chelidonium majus*, *Delphinium Staphysagria*, *Narcissus pseudonarcissus*, *Oenanthe crocata*, *Gratiola officinalis*, *Jatropha curcas*, *Scilla maritima*, *Sedum acre*, *Ranunculus acris*, *R. sceleratus*, *R. flammula*, *Rhododendron crysanthum*, *Fritilaria imperialis*, *Pedicularis palustris*, *Cyclamen Europæum*, *Plumbago Europæa*, *Colchicum autumnale*, *Convolvulus scammonea*, *Cerbera ahovai*, *Cynanthum erectum*, *Lobelia syphilitica*, *Apocynum androsæmifolium*, *A. cannabinum*, *A. venetum*, *Asclepias gigantea*, *Hydrocotile vulgaris*, *Clematitis vitalba*, *C. flammula*, *C. recta*, *C. integrifolia*, *Pastinaca sa-*

tiva, *Sœlanthus quadragonus*, *Phytolacca decandra*, *Croton tiglium*, *Arum maculatum*, *A. dracunculus*, *Adracontium*, *A. colocasia*, *A. esculentum*, *A. virginicum*, *A. arborescens*, *A. seguinum*, *Calla palustris*. From the mineral kingdom *Nitrate of Potash*, *Chlorine*, *Nitrous acid gas*, and *Sulphurous acid gas*.

Our author enters more or less upon the poisonous properties of this long list of substances, but our limits will not permit us to pursue him very closely. Indeed we despair of giving an account of the present volume, that shall be barely tolerable to the general reader. Consisting, as this work in general does, of a dry recital of cruel experiments upon poor animals, we even ourselves set about the task with disgust, and the general reader, who feels no particular interest in similar objects, had better perhaps abstain from M. Orfila's work altogether. But independently of this, the present volume necessarily consists of a series of details, which, in a review, there are only two modes of treating—either to pass them over altogether, or to enter more or less into them. For the sake of those of our readers who may feel interested in the subject, but who may not have leisure or opportunity of consulting the original, we shall prefer the latter mode; and with this view, shall give the conclusions drawn by our author from his experiments, upon some of the most important poisonous substances. But we think it our duty to warn our readers, that they will generally find these conclusions vague and unsatisfactory, and proving little more than that the different poisons destroy life in some unknown manner, by acting upon the nervous system.

In treating of individual poisonous substances, our author follows the same general plan formerly stated. When these substances are plants, he begins by relating their botanical and physical characters, and points out those parts of the plant in question which are usually employed. He then relates experiments and cases, illustrative of their poisonous effects upon the animal economy, and concludes with the general observations above alluded to.

Veratrum album, *White Hellebore*, and *Helleborus niger*. *Black Hellebore*. M. Orfila relates seven experiments made upon dogs with the first of these substances, in various manners and doses; and afterwards relates cases from Etmuller,

Schreder, Helmont, and others, demonstrative of its poisonous effects upon the human subject. He then relates the same number of similar experiments made with the *Helleborus niger*, in which he observed the effects which it produces upon the rectum, where the animal survived some hours, though the rest of the alimentary canal was not affected. From his experiments and observations he draws the following general conclusions respecting the operation of these poisons.

"1. That the pulverized roots of both black and white hellebore, applied to the cellular substance, are quickly absorbed, carried into the sanguiferous system, and produce violent vomitings, and many effects upon the nervous system which appear analogous to those produced by narcotics; and which soon destroy the animal.

"2. That they produce local inflammation when applied externally to the bodies of animals, but in too slight a degree to occasion immediate death.

"3. That their operation is similar when taken into the stomach, but in this case their effects are more slow and less intense.

"4. That if animals have the power of vomiting, death does not always take place. But when vomiting does not occur, death is constantly produced by a certain dose.

"5. That the root of the white is more active than that of the black hellebore.

"6. That the poisonous properties of the roots of both species of hellebore, reside in those principles which are soluble in water.

"7. That the alkaline extract, which forms a part of Bacher's tonic pills, is likewise very active."

The quantity of the powder of the roots of both these plants found by Mr. Orfila to prove fatal to dogs when taken into the stomach, was from two to three French drachms* (*gros:*) applied externally, 20 French grains of the white hellebore proved fatal. M. Orfila concludes his account of these poisons, by quoting instances from the London Chronicle, No.

* The French *gros* or drachm is 59.0703 grains Troy. Some of our contemporaries, in reviewing M. Orfila's work, *have mistaken the gros for the grain!*

1760, for the year 1768, and from the Oxford Magazine, for March 1779, to show the poisonous effects of another of this genus, the *fœtid Hellebore.*

Momordica elaterium. Wild cucumber. The prepared pulp of the fruit of this plant was employed. Our author relates experiments made upon dogs in his usual modes, all which proved fatal, and he concludes from these,

"1. That the primary effects of elaterium depend upon the inflammation which it excites as much as upon its absorption.

"2. That the cause of death induced by the administration or application of this substance, is the sympathetic affection of the nervous system.

"3. That it acts in a particular manner upon the rectum."

About three French drachms were used by M. Orfila, in his experiments.

Cucumis colocynthis. Our author made, as usual, several experiments upon dogs with this substance. He also relates instances of its poisonous effects upon the human subject from different authors, and he concludes,

"1. That the effects of colocynth depend chiefly upon its local action, and the sympathetic irritation produced in the nervous system.

"2. That it is however absorbed, and carried into the sanguiferous system, upon which it directly acts, and also upon the rectum.

"3. That both the soluble and insoluble portions of the poison are equally active.

"4. That it appears to operate upon men in the same manner as upon dogs."

Three drachms and upwards of this substance were used by M. Orfila in his experiments. He supposes that this and other poisonous substances, which appear to act so violently on the stomach and rectum, without affecting the small intestines, produce these effects by the longer stay which they make in the extremities of the alimentary canal, than in the small intestines, through which he supposes they pass very rapidly. With regard to this explanation, we must confess that we do not think it sufficient to account for the phenomena, though we have not a better to offer.

Gamboge, the produce of the *Stalagmites cambogioides*. M. Orfila used from one to three or four drachms of this substance in his experiments, from which he concludes,

"1. That in dogs who retain the power of vomiting, a large dose of gamboge may be taken without proving fatal.

"2. That when vomiting cannot take place, death speedily follows its exhibition, which does not appear to depend upon its absorption, but upon the local energetic action which it exerts, and the sympathetic irritation of the nervous system.

"3. That it speedily destroys life when applied to the cellular substance, and that its effects are analogous to those of an extensive burn, in which an eschar is not produced."

Ricinus communis. The seeds of this plant contain its active principle. From thirty grains to three drams of these were used by M. Orfila in his experiments, from which he concludes, that besides the local irritation they produce, they are absorbed, and thus act upon the nervous system.

Euphorbia officinarum. Besides this species, our author made experiments upon the *E. lathysis*, and *E. cyparissias*. Of these, the last seems to possess least activity. From two drachms to half an ounce of the well-known product of the first species were used; of the second species, eight ounces of its juice; and of the third, five ounces of its juice were employed. He concludes from his experiment, and the observations of others,

"1. That euphorbium exerts a very powerful action, capable of producing acute inflammation.

"2. That its fatal effects arise more from a sympathetic affection of the nervous system than upon absorption.

"3. That it appears to act in the same manner upon men as dogs."

Most of the other species of euphorbia are poisonous.

Juniperus sabina. M. Orfila made three experiments with the leaves of this plant, in doses of two to six drachms, all which proved fatal; and he concludes that it exerts a very powerful local action, but that its effects chiefly depend upon its being absorbed, and thus acting upon the nervous system, the stomach and the rectum.

Rhus radicans et R. toxicodendron. Our author seems to

adopt the opinion of M. Bosc,* that the *R. radicans* is not a distinct species, but only a variety of the *R. toxicodendron.* He concludes from his own observations, and those of others,

"1. That the most active part, both of the *R. radicans* and *R. toxicodendron*, is disengaged in a gaseous state, while it is excluded from the direct rays of the sun.

"2. That it acts like the acrid poisons.

"3. That the aqueous extract, both internally and externally applied, produces local irritation, followed by more or less inflammation, and exerts a stupifying effect on the nervous system, after being absorbed.

"4. That its action is similar when injected into the jugular vein."

The first of these conclusions is drawn chiefly from the observation of Van Mons, who has endeavoured to show, that the deleterious effects of the fresh plant depend more upon a peculiar poisonous principle which is exhaled in solution in carburetted hydrogen gas, by the plant during the night, and in the shade, than upon its juice.† The speculations of Van Mons should be received with caution.

Another species of this genus, the *R. vernix*, is said by M. Orfila, to possess similar properties.

Aconitum Napellus. Wolf's-bane. Our author's first experiments were made with the extract of this plant procured from different druggists, in doses of from eighteen grains to two drachms. These extracts were made in the usual manner by exposure to great heat. He afterwards made some experiments with an extract made upon a water bath, which were much more active, and he has taken this opportunity of offering some judicious remarks upon the propriety of preparing all vegetable extracts in this manner. From his own experiments, and those of many others which he notices, he concludes,

"1. That the juice of the leaves of the aconite, introduced into the stomach or rectum, or injected into the cellular substance of dogs, excites destructive effects, speedily followed by death.

* See Actes de la Société de Médécine de Bruxelles.

† See Idem.

"2. 3. 4. That the root of the plant appears more active than the juice of the leaves; and that the watery extract, prepared with the expressed juice of the recent plant, possesses nearly the same poisonous properties as the juice itself; but that it is considerably less active, if prepared by decoction; and that the resinous extract is more active than the watery.

"5. 6. That the different preparations are absorbed, and carried into the circulation, where they act upon the nervous system, especially the brain, producing a sort of mental alienation; and that they also excite a local irritation, terminating, more or less, in inflammation.

"7. That they seem to produce the same effects upon men as dogs."

Instances are quoted by our author, to prove that other species of this genus, as the *A. Cammarum*, *A. Anthora*, and the *A. Lycoctonum*, are poisonous.

Delphinium Staphysagria. Stavesacre. An ounce of the powdered seeds of this plant taken internally, proved speedily fatal to a dog; and so small a quantity as two drachms applied externally had the same effect. M. Orfila's conclusions respecting this plant are,

"1. 2. That it is not absorbed; but its deleterious effects arise from the local irritation it produces, and a sympathetic action of the nervous system. That the part soluble in water is the most active, and that its local effects are stronger when it is moistened before it is applied to the cellular substance."

In a note we are informed, that the brain was examined in most of the before-mentioned instances, when affections of the nervous system appeared, but that no derangement of this organ was visible.

Oenanthe crocata. Hemlock dropwort. So many instances on record demonstrate the poisonous properties of this plant, and which are quoted by M. Orfila, that he did not think it necessary to institute experiments with it. From these observations, therefore, he draws the vague conclusions, that this plant excites a strong local irritation, and acts powerfully upon the nervous system. Two instances are also noticed of the poisonous nature of another of this genus, the *Oe. fistulosa.*

Gratiola officinalis. Hedge Hyssop. The quantity of the wa-

tery extract of this plant, used by M. Orfila, was about three drachms. But so small a quantity as twenty-eight grains, injected into the jugular vein, proved fatal. The conclusions are,

" 1. That this extract produces a severe local irritation.

" 2. 3. That it is not absorbed; but that its effects depend upon the sympathetic affection of the brain, and that it is much more active when injected into the veins."

Jatropha curcas. From one to three drams of the seeds of this plant, deprived of their external coverings, and beat into a paste, were employed; the results were,

" 1. 2. That they possess very powerful poisonous properties. That they are not absorbed, but their deleterious effects depend on the severe inflammation which they induce, and their sympathetic action on the nervous system.

" 3. That they act more violently when introduced into the stomach than when applied to the cellular substance."

The poisonous properties of two others of this species are also noticed, namely the *J. manihot*, and the *J. multifida.*

Scilla maritima. The Squill. Mr. Orfila's experiments were made from 36 grs. to 2 drachms of the dry powder, and with about two ounces of the recent root; and he concludes from them,

" 1. 2. That its fatal effects depend principally upon its absorption, and the action it exerts on the nervous system. That the lungs are not disorganized, but that the quickened respiration depends upon nervous influence.

" 3. 4. That local irritation is, however, excited, which is more energetic as death is longer in taking place; and that it often excites nausea and vomiting."

Ranunculus acris. Meadow crowfoot. this, as well as most of the other species of this genus, are active poisons. M. Orfila particularly mentions the *R. sceleratus* and the *R. flammula*, he observes that the *R. bulbosus*, *R. ficaria*, *R. thora*, *R. arvensis*, *R. alpestris*, *R. polyanthemos*, *R. illyricus*, *R. gramineus*, *R. asiaticus*, *R. aquatilis*, *R. platonifolius*, *R. breynius*, and *R. sardous*, are equally poisonous. The conclusions are,

" 1. 2. 3. That these different species of ranunculus and their extracts produce acute inflammation of the parts to which they are applied; but that their fatal effects depend upon the

sympathetic action upon the nervous system; that they do not appear to be absorbed."

The remaining poisons from the vegetable kingdom above enumerated, and which are classed together under the name of *acrid*, are very briefly treated of by our author; we shall only, therefore, notice one or two of the chief.

Colchicum autumnale. Meadow Saffron. Concerning this plant, which has lately attracted a good deal of notice from its being supposed to be the basis of the *eau medicinale*, various opinions have been held, and are quoted by our author. From his own experiments one would hardly suppose it to be poisonous, as he informs us that he gave in the month of June two or three of the fresh roots bruised, without any sensible effects. Others, however, maintain that it is capable of acting as a violent poison by inducing vomiting, &c. with inflammation of the stomach and death. Our author endeavours to reconcile these accounts by supposing that the properties of the plant vary with the climate and season.

Arum maculatum. The root of this plant was found by M. Orfila to prove fatal to dogs, and a case is related from Bulliard where two out of three children who had eaten of the leaves died, and the third had a narrow escape.

After the vegetable poisons ranked by our author in this class, he proceeds to consider those of the mineral kingdom, which he supposes to act in a similar manner, and the first on the list is the

Nitrate of Potash. There are many instances on record of the fatal effects produced by this salt, when taken in considerable doses. Some of these are enumerated by our author, and from these and from experiments made by him on dogs, he concludes,

"1. That nitrate of potash taken into the stomachs of dogs or of men, acts like the acrid or corrosive poisons.

"2. That when vomiting does not take place, it is capable of producing death in doses of two or three drachms.

"3. That it appears to act immediately upon the mucous membrane of the alimentary canal, and afterwards upon the nervous system, producing a stupifying effect.

"4. 5. That it is not absorbed when applied to the cellular

substance, and consequently in this case produces only local effects. That the opinion of M. Tourtelle, a physician at Besançon, who supposes that this salt acts like other neutral salts, cannot be admitted."

Chlorine. This gas, according to M. Nysten, whose opinion is adopted by M. Orfila, is not absorbed when respired, but destroys life by its powerful action upon the organs of respiration. When in solution in water it acts like the other mineral acids.

Nitrous Acid Gas. Our author quotes a case in which the inspiration of this gas proved fatal. He supposes its fatal effects to depend partly upon its destructive operation upon the organs of respiration, and partly upon the change which it induces in the blood, which he considers as analogous to that produced by nitrous gas. When in solution in water, its effects are similar to those of nitric acid.

Sulphurous Acid Gas. The fumes of burning sulphur. This gas is capable of producing death when respired by its irritating effects upon the lungs. M. Orfila does not notice its effects upon the blood.

After this detailed account, our author takes a general survey of the symptoms produced by this class of poisons, of their action upon the animal economy, and of the mode of treatment to be adopted in cases of poisoning by them. We shall briefly notice what he has advanced on each of these subjects.

Some time after the poisonous substance has been administered, there is a sensation of an acrid, sharp, and more or less bitter taste in the mouth, and the mouth and tongue are hot and dry, and there is a painful sense of constriction in the throat. These are soon succeeded by acute pains in the stomach and bowels, which are followed by nausea, and generally abundant evacuations both upwards and downwards. These evacuations sometimes take place without effort, but generally they are excessively painful, and proceed till the whole contents of the alimentary canal are evacuated. The pulse is strong, frequent, and pretty regular. Respiration is somewhat quickened, and there is a perceptible change in the sensation and movements of the animal. Some hours after this, symptoms of derangement in the nervous system take place. The animal

walks unsteadily. The pupils of the eyes are dilated, and he falls into a state of great insensibility. Respiration and circulation become languid, and he sinks without uttering the least cry. Sometimes, however, convulsions, more or less violent, take place, the extremities become stiff, and he dies uttering plaintive cries.

Our limits will not permit us to enter minutely into the effects produced and observable after death. Generally, the mouth, stomach, and intestinal canal, are found inflamed, the lungs also are affected in a similar manner, and the heart is commonly gorged with blood. The brain and its membranes are not sensibly affected. When the poison has been externally applied, all these appearances are observable, except that the stomach and alimentary canal are seldom affected. Our author's general conclusions from his observations are,

"1. That in a case of poisoning the physician will be greatly puzzled to discover, from the mere appearance found after death, if the poisonous substance belonged to the class of *corrosive* or *acrid* poisons.

"2. That even if the class to which the poison belongs be discovered by other means, yet it cannot be decided from the appearances found after death, *what particular* poison has been taken, the effects produced by the whole class being nearly the same.

"3. That it can, however, be generally ascertained by attending to the degree of inflammation found after death, that the poison has not belonged to the narcotic or narcotico-acrid classes, as these produce very slight inflammation."

In his observations upon the action of these poisons upon the animal economy, our author points out the very different manner in which the different substances he has classed together operate, and he candidly acknowledges the imperfection of the classification he has adopted, and the great difficulty of forming one upon similar principles free from objections. For example, he observes that some of the poisons of this class chiefly act locally, and produce death by sympathetically affecting the nervous system. Such are the Garou, the Jatropa curcas, &c. Others, besides producing local effects, are absorbed, as colocynth, savine, &c. Others produce comparatively slight local

effects, but are rapidly absorbed, and taken into the sanguiferous system, thus producing their deleterious effects, as the black and white hellebore, &c. Lastly, others are rapidly absorbed, and exert their effects at once upon the nervous system, as the aconite. Our author concludes this section by some good observations upon the circumstances upon which an opinion respecting absorption or non-absorption of a poison is to be formed.

"Does there exist any antidote to the acrid poisons?" In reply to this question, which our author as usual proposes to himself, he remarks, that in the common acceptation of the word there is no antidote to these poisons, most of them being organized substances, with the chemical properties of which we are unacquainted. He recommends, that when the poisonous substance is one of those which excite acute inflammation, &c. that the antiphlogistic treatment should be adopted, vomiting having been previously encouraged by tepid mucilaginous diluents, and even cold water. All irritating means, as emetics, vinegar, &c. should be avoided. To moderate excessive vomiting he recommends laudanum. If the poison be one of those that acts chiefly upon the nervous system, he recommends an infusion of coffee, and small doses of camphor; and if these be rejected, clysters, frictions, and demulcent drinks, are ordered. If vomiting does not spontaneously occur, our author recommends the exhibition of an emetic. If, instead of coma, there be high excitement of the nervous system, opiates and other means to diminish this must be had recourse to. And in general "we may," says our author, "reduce all that is to be done in these cases to the two following rules. 1. When the poison does not produce evacuations, to have recourse to copious dilution with mucilaginous drinks. 2. To observe particularly the secondary symptoms, and to combat them by appropriate means, which, of course, must vary with the nature of the injury."

Class IV. *Narcotic Poisons.* M. Orfila terms these poisons *Narcotic*, which "are rapidly absorbed and occasion stupor, drowsiness, palsy, or apoplexy, and convulsive motions." under this head are ranked *Opium*, *Hyosciamus niger*, *H. albus*, *Prussic acid*, *Prunus lauro-cerasus*, *Bitter almonds*, *Lac-*

tuca virosa, *Solanum nigrum*, *S. fuscatum*, *&c.*, *Taxus baccata*, *Actæa spicata*, *Physalis somnifera*, *Azalea Pontica*, *Ervum ervilia*, *Lathyrus cycera*, *Peganum harmela*, *Paris quadrifolia*, *Saffron*, and *Azotic gas* and its compounds. Our author is very brief on many of these, and we shall only notice some of the more important.

Opium. M. Orfila begins, as usual, by describing the physical and chemical properties of this important substance. The latter he adopts from M. Derosne, who states the constituents of opium to be, 1. a crystallizable substance; 2. extractive matter; 3. resin; 4. oil; 5. an acid; 6. some fecula; 7. mucilage; 8. gluten; 9. vegetable fibres, which, with occasionally a little sand, &c., are extraneous.

Our author, as usual, instituted a number of experiments upon dogs with this drug, both in its crude state, in the form of an aqueous extract, &c., and he concludes from these, and the observations of others, with M. Nysten,

"1. That an extract prepared with cold water, and evaporated only once, is more active than the other products of opium, without excepting the gummy extract of Cornel, Baume, and Rousseau, prepared by repeated evaporations, long digestion, or by fermentation.

"2. The resinous matter, which is little soluble, produces similar effects to the aqueous extract, but requires to be given in a larger dose, and it does not inflame the mucous membrane of the stomach. If inflammation of this organ has been observed in a case of poisoning with opium, it must therefore be ascribed to the spirituous menstruum in which it had been taken, or some other irritating substance given as an antidote.

"3. The crystallizable principle of opium, which has been improperly termed the *narcotic principle*, is still less active than the resin. M. Nysten swallowed four grains of it, and only experienced a slight disposition to sleep.

"4. The pellicle which separates during the evaporation, acts less powerfully than the crystallizable principle.

"5. The distilled water of opium, strongly impregnated with the aromatic principle, induces intoxication, and sleep in a larger dose. M. Nysten swallowed two ounces of it without experiencing any sensible effect.

"6. Three or four grains of the watery extract of opium injected into the carotid of a dog, kill it in a few minutes.

"7, 8. A little larger dose is necessary to produce a similar effect when it is injected into the crural or jugular vein. Injected into the pleura or peritoneum, it likewise proves fatal. Injected into the cellular substance, the fatal effects of opium are much less speedy and energetic.

"9. The effects take place equally when the watery extract is injected into the bladder, but a large quantity is necessary to produce death.

"10. The application of opium to the brain, does not prove fatal, although it is by its peculiar action on this organ, that opium taken into the constitution, produces dangerous symptoms.

"11. Opium does not destroy the contractile power of the muscles to which it is applied, and the symptoms of poisoning which occur in this case, depend upon its absorption and action upon the brain. A heart plunged into a solution of opium, continues to contract in it for a very considerable time.

"12. The supposed analogy between the action of wine and opium is incorrect. Opium, be the dose small or large, instantly diminishes the vital powers, and it is from this property that it acts as a sedative. Wine, on the contrary, always restores those powers, and even where it debilitates, this is in consequence of the previous great excitement which it has induced.

"13. Opium does not produce death by acting upon the extremities of the nerves of the stomach, as has been supposed; for animals having the *par vagum* divided on both sides, die in two or three hours, after experiencing the usual symptoms, intoxication, somnolency, and convulsions."

Our author considers the much agitated question, whether opium acts as a sedative or stimulant, and he quotes a long list of advocates for both sides of the question. He dissents, however, from both these opinions, and concludes, from his own observations,

"*A*. That opium employed in a strong dose, cannot be arranged either with narcotics or stimulants, but it exerts a pe-

culiar action, which cannot be exactly designated by any term employed in the *materia medica*.

"*B*. That employed in a small dose, it chiefly acts by producing stupefaction, but that sometimes, from idiosyncrasy, it produces a great degree of excitement.

"*C*. That no analogy exists between the action of opium and spirituous liquors in large doses."

The nature of the action of opium, after all the poor animals that have been sacrificed, and all that has been said on the subject, appears to us to be as little understood as ever; for with all deference to our pains-taking author, we cannot discover that he has thrown the least light upon the subject.

Hyosciamus niger. *Henbane*. Most of this genus appear to possess poisonous properties. M. Orfila made no less than sixteen experiments with the *H. niger*, and from these and various histories which he quotes, he concludes,

"1, 2. That the juice and decoction of the root of henbane in full vegetation, produce fatal effects when introduced into the stomach, but that in the spring the effects of this plant are less powerful; and that the juice of the leaves is less active.

"3. That the aqueous extract, prepared by evaporating the juice of the recent full blown plant in a water bath, possesses nearly the same effects as the juice itself; but that an extract prepared from a decoction of the plant not completely developed or over dried, is much less active; a fact which explains why the extract of commerce generally possesses little or no virtue.

"4, 5. That the preparations of this plant act nearly in the same manner, whether they be applied to the cellular substance, or taken into the stomach or injected into the veins. In the last of which cases, a very small quantity proves fatal. In each case they are absorbed, carried into the circulation, and produce a remarkable effect upon the nervous system, which may be compared to mental alienation, and to which succeeds deep stupor.

"6, 7. That they do not inflame the stomach, and that they apparently act in the same manner upon the human subject as upon dogs."

The Prussic acid. This acid, as lately obtained by Gay Lu-

sac in its most concentrated form, is a colourless transparent fluid, so exceedingly volatile, that, on being exposed to the air, it congeals by the cold which it produces by its own evaporation.* Its sensible properties are strongly marked, and it has been shown that the poisonous properties of the essential oil and distilled water of the *Prunus lauro-cerasus*, and bitter almonds, owe their deleterious properties to this acid. Hence M. Orfila treats of these different substances under the same head. He concludes from his experiments,

"1. That the Prussic acid proves fatal to the different classes of animals, but particularly to the warm blooded. Insects die in it as speedily as the warm blooded animals, but they differ from the warm blooded animals by the inverse order in which their parts die. 2. That death is induced more speedily in proportion to the rapidity of the circulation, and as the organs of respiration are more extended. 3. That it is most destructive to young animals. 4. That it acts upon every tissue with which it comes in contact, except the nerves and *dura mater*. 5. That it varies in the intensity of its action according to the part to which it was applied. For example, it is very deleterious when injected into the jugular vein, or trachea, less so when injected into the thorax, and still less when injected into the stomach or rectum. Applied to wounds, its action is much less still, but death takes place more speedily when the wounds are situated in the anterior extremities (Emmert.) 6. That if the dose be not strong enough to induce death, the animal very generally revives. 7. That its effects depend upon its being absorbed and carried into the course of the circulation. 8. That its action is slow, but not suspended when it is placed in contact with a part, the communication of which with the brain or spinal marrow is cut off. 9. That it operates upon man the same as upon other warm blooded animals. 10. That it destroys irritability, and ought to be ranged with the narcotic poisons. 11. That it does not produce any inflammatory action capable of being observed after death. But that the venous system appears full of blood, whilst the arterial is empty; the pupils often dilated, and the lungs spotted—effects common to a great number of the stupifying poisons."

* Annales de Chimie, t. 77, p. 128.

The distilled water and oil of the laurel and bitter almonds, act, according to M. Orfila, in a similar manner, but the watery extract of the laurel is little poisonous, from the volatilization of the Prussic acid.

Lactuca virosa. Strong scented lettuce. This does not appear from M. Orfila's experiments to be a very active poison, though its watery extract, either applied to a wound or taken internally, sooner or later proved fatal.

Solana. Different species of nightshade. According to Dunal, whom our author quotes, none of this genus prove very active poisons. He found, however, that the extract of the *solanum nigrum* is slowly absorbed, and destroys the sensibility and mobility of the muscles. Many of this genus, according to Dunal, have the property of dilating the pupil, and rendering the eye insensible to light, in a manner similar to the *belladonna*, but in a less degree.

None of the other plants above enumerated, possess either very active or remarkable poisonous properties.

Azotic gas and its compounds all prove fatal sooner or later when inhaled. M. Orfila quotes an experiment from Nysten, in which azotic gas was injected into the jugular vein, and in which it appeared to influence the heart, and produce a sedative effect. He then proceeds to quote the experiments of Davy, Proust, Psaff, and others, with the nitrous oxide, which produced upon himself very unpleasant effects, such as vertigo, great uneasiness and burning heat in the chest, which terminated in syncope, that lasted six minutes; and the experiments of Nysten, afterwards quoted by our author, seemed to show, that nearly similar effects are produced when this gas is injected into the blood vessels of an animal.

Our author next proceeds to consider the general effects produced by this class of poisons. These, as usual, are subject to all the defects we formerly noticed. We shall, however, give them in his own words.

"Stupor, dulness, heaviness of the head. A desire to sleep, which at length cannot be overcome; vertigo, a sort of intoxication, delirium, furious or lively, sometimes pain. Convulsions more or less strong over the whole body; paralysis of the posterior extremities, dilatation of the pupil, diminished

sensibility of the organs of sense, as in apoplexy, pulse frequent, or slow, and at first generally full and strong. Respiration little affected, but sometimes a little quicker than natural, nausea and vomiting, especially when the poison has been applied to the cellular tissue, or injected into the rectum. The affections of the nervous system increase, and at length the animal dies. Death very speedily takes place when the poison has been injected into the veins, less speedily when it has been applied to the cellular tissue, and slowest of all when it has been taken into the stomach."

After death the alimentary canal is stated by M. Orfila to be found little affected by these poisons, and they seem to act, when applied externally, little more than any other foreign substance. The lungs are frequently affected in the same manner as with the acrid poisons. The blood contained in the heart and veins, is frequently coagulated soon after death. The veins of the brain and its membranes, frequently present the appearance of being gorged with blood, but the injuries of the other organs are not appreciable.

Our author next inquires into the mode of treating cases of poisoning by the different substances of this class. He enumerates these means in the following manner: 1. Vinegar, and the vegetable acids. 2. The infusion and decoction of coffee. 3. The solution of chlorine in water (oxymuriatic acid.) 4. Camphor. 5. Water, and emollient fluids; and 6. Blood-letting.

1. Of vinegar and the vegetable acids. Our author concludes, from a great number of experiments, that these, so far from being antidotes to opium, always aggravate its effects, when taken before the animal has vomited. This aggravation appears to depend upon the inflammation of the stomach, which these acids produce when conjoined with opium. On the contrary, when the poisonous substances have been ejected by vomiting, the vegetable acids have the property of diminishing the symptoms of the poison, and even altogether overcoming them. 2. Coffee. Our author's experiments induce him to conclude, that coffee does not, like vinegar, increase the effects of the poison, but that a well prepared infusion taken in frequently repeated doses, rapidly diminishes the

effects of poisoning by opium, and may even completely overcome them. 3. Chlorine. This cannot be administered of that degree of strength necessary to decompose the opium, without producing dangerous consequences, and in its dilute state it acts like vinegar, and has no particular advantages over that acid. 4. Camphor. M. Orfila concludes from his experiments with this alleged antidote, that it neither decomposes opium, nor prevents its action as a poison. 5. Water and mucilaginous drinks in general. Our author was induced to try the effects of these antidotes from their having been lately recommended by M. Porta; but he concludes from his experiments, that water is more likely to prove dangerous than useful, by dissolving the opium, especially when acidulated, and thus facilitating its absorption. 6. Blood-letting. M. Orfila's conclusions respecting this remedy are, That it may be useful, especially in the plethoric, and he recommends the jugular vein to be opened in preference.

The means to be adopted, therefore, in cases of poisoning by opium, are, according to our author, in the first place to produce full vomiting, either by the sulphate of zinc or copper, or by *injecting a solution of tartar emetic into the veins* (we doubt if any one will be found hardy enough to perform this latter operation,) and thus, if possible, to expel the poison from the stomach. The emetic substances should not be dissolved in a large proportion of water, nor the stomach filled with mucilaginous, acid, or even aqueous drinks, for the reasons above mentioned. After the opium has been expelled, the jugular vein may be opened, and more or less blood be abstracted, according to the constitution of the patient. Water, acidulated with the vegetable acids, may now be administered alternately with coffee; these should be given in small quantities, and repeated every ten minutes. Camphor injections may be now had recourse to; or, if the opium has descended into the large intestines, purgative clysters may be employed with advantage.

Most of our author's observations have been made on dogs; and, as some objection may be made to his conclusions from this circumstance, he gives it as his opinion, drawn from upwards of TWO THOUSAND experiments made upon these poor

animals; that the nature of the symptoms produced by poisons, and the means of counteracting them, are the same as those in the human subject; and that the only difference is in the quantity necessary to produce the same effect, and in the relative moral and physical powers of the animals.

The same means are recommended in cases of poisoning with henbane, and the other vegetable narcotics; but for the Prussic acid, and substances containing it, the oil of turpentine, and other stimulants are recommended, on the authority of Emmert, after a powerful emetic has been administered.

Class V. *Narcotico-acrid poisons.* This class is intended to include those substances which have an acrid nauseous taste, and which act, at the same time, as narcotics and rubefacients; but our author justly observes, that the name, in many instances, is very inapplicable. Indeed, it appears to us astonishing, how M. Orfila, aware as he evidently is of the imperfections of the classification he has adopted, could have chosen it.

Under this class are included, *Atropa Belladonna*, *Datura Stramonium*, *Tobacco*, *Digitalis*, *Anagallis arvensis*, *Aristolochia*, *Conium Maculatum*, *Cicuta virosa*, *Œthusa cynapium*, *Ruta graveolens*, *Nerium oleander*, *Upas tieuté*, *Strychnos nux vomica*, *Faba Sti. Ignatii*, *Angustura Pseudo-ferruginæa*, *Upas-antiar*, *Ticunas*, *Woorara*, *Camphor*, *Menispermum cocculus*, *Fungi*, as the *Agaricus muscarius*, *A. bulbosus*, *A. conicus*, &c. &c. Also *Alcohol*, *Ether*, *Carbonic acid gas*, *Carbonic oxide*, *Carburetted hydrogen*, &c.

Atropa belladonna. M. Orfila concludes from his own experiments, and the observations of others,

"1. That *belladonna* and its extract possess very energetic poisonous properties.

"2, 3. That their local action is not powerful, but that they are absorbed, and thus carried into the course of the circulation, and act upon the nervous system, especially the brain; and that the symptoms they produce do not differ sensibly from those produced by many other poisons, as some have supposed.

"4. That the most active extracts are those prepared by evaporating at a low temperature, the juice of the fresh plant.

"5. 6. That their action is more intense when injected into the veins, than when they are externally applied, or particularly when they are taken into the stomach; and that they act the same upon men as upon dogs."

The quantity used by M. Orfila in his experiments, was from a few grains to half an ounce.

Datura Stramonium. This, as well as some others of the genus *Datura*, as the *D. metela*, the *D. tatula*, and *D. Ferox*, are all stated by our author, either from his own observations, or those of others, to be poisonous, and to produce nearly the same effects as *belladonna*, only that the *D. Stramonium* seems to act more powerfully upon the brain. The dried stem and leaves of this plant have been lately much used in this country for smoking; but its effects are sometimes in this way very powerful, and even alarming.

Tobacco. Our author, besides his own experiments, details those of Mr. Brodie and others, among which are some communicated to him, by Dr. Macartney, of Dublin; from these he concludes,

"1. 2. That the leaves of tobacco, either entire or in a state of powder, as usually sold, possess active poisonous properties; and that their active principle appears to be dissolved in water, and absorbed and carried into the course of the circulation.

"3. 4. 5. That they appear to act chiefly on the nervous system, and produce a general tremor, such as is rarely produced by other poisonous substances; that their action is more powerful when the solution of their active principle is injected into the anus, than when applied to the cellular substance, and especially than when introduced into the stomach; and that, independently of these phenomena, they are capable of acting locally, and producing more or less of inflammation.

"6. That they appear to act in the same manner upon men as upon dogs.

"7. That the empyreumatic oil does not act immediately upon the brain and nerves, but that it operates upon the nervous system in a manner which it is not at present easy to explain.

"8. That the extract of the *nicotiana rustica* operates in a similar manner to tobacco, but is less active."

Digitalis purpurea. Foxglove. An analysis of this active plant has been made by M. Bidault de Villiers, which is given by our author; but as it throws no light on the nature of its poison, we do not think it worth while to notice it. His conclusions from his numerous experiments, and the observations of others, are,

"1. 2. That the powder, the watery and resinous extracts, and the tincture, in certain doses, are to be regarded as energetic poisons, but the resinous extract is more active than the aqueous, and the aqueous than the powdered plant.

"3. That the resinous extract acts strongly and speedily when injected into the jugular vein; that it is less active when applied to the cellular substance, and still much less so when introduced into the stomach, notwithstanding vomiting be prevented.

"4. 5. That all these preparations operate in the first place as emetics, that their effects upon the circulation vary in different individuals. Sometimes no change can be observed in the functions of the system: sometimes the pulse is rendered more slow, but quite as often it is accelerated, and becomes strong, unequal, and intermittent.

"6. That the resinous extract appears to act more especially upon the heart or the blood, as this fluid is instantly found coagulated immediately after death, when the extract has been applied to the cellular substance, or introduced into the stomach.

"7. 8. 9. That independently of these phenomena, this plant and its preparations act upon the brain, after having been absorbed, and produce a sort of instantaneous stupefaction, which is speedily followed by death. That the plant in powder is capable of exciting considerable local inflammation; and lastly, there is every reason to believe that this plant acts upon men in the same manner as upon dogs."

M. Orfila states, in a note, that he has taken daily from four to twenty grains of this plant in a state of powder, for a month, without producing any effect upon the pulse: hence he seems to doubt the opinion commonly maintained respecting

the properties of this plant. Had he made his experiments with the resinous extract instead of the powder, which he acknowledges is the most inefficient of all its preparations, and at the same time the most liable to be injured by the preparation or by being kept, his results would have been more satisfactory.

Conium maculatum and Cicuta virosa. Hemlock, and water hemlock. Our author's conclusions from his experiments, and the observations of others, respecting these plants, which appear to operate similarly, but in different degrees, the *C. virosa* being most active, are

"1. 2. That the fresh leaves furnish at a certain period a juice which acts as a powerful poison, but the juice of the roots obtained at the same time is less active. That the aqueous extract prepared upon a water bath, retains most of the properties of the plant; but that it is less active, and sometimes almost inert, when prepared by boiling the dry powder in water, and evaporating the decoction at a high temperature.

"3. That the different preparations of this plant act more rapidly and strongly when injected into the jugular vein than when applied to the cellular substance, or taken into the stomach.

"4. 5. That they are absorbed, carried into the circulation, and act upon the nervous system, especially the brain; and, lastly, that they excite also a local inflammation."

The next poisonous substances which are mentioned by M. Orfila, and which we think it important to notice, are the *Upas tieuté*, the *nux vomica*, and the *faba Sancti Ignatii*, all which he considers as belonging to the genus *strychnos*. The *Upas tieuté* has generally been confounded by authors with the *Upas-antiar*, but the former is the production of a sarmentitious plant, the latter of a tree. M. Orfila details the results of seventeen experiments made with the *Upas tieuté*, of fifteen with the *nux vomica*, and of two with the *faba Sancti Ignatii*, besides many observations from others; and he concludes,

"1. These three substances act as very energetic poisons upon a great number of animals, and also on man.

"2. That they may be regarded as exciting the spinal marrow, upon which they appear to act by producing tetanus, im-

mobility of the thorax, and consequently asphyxia, which proves fatal to the animal.

"3. 4. To whatever part of the surface of the body they are applied, they are absorbed, carried into the course of the circulation, and appear to operate, as M. Majendie first observed, through the medium of the veins.* They act very speedily when injected into the pleura, the peritoneum, or jugular vein, more slowly when applied externally, or injected into the arteries distant from the heart, and their effects are still more slowly manifested when they are applied to mucous surfaces.

"5. They produce no effect when the spinal marrow is elevated by a slip of whalebone.

"6. The watery extract of the *nux vomica* and *St. Ignatius's bean*, are more active than the powders of the seeds, but less so than the resinous extracts.

"7. None of these poisons excite local inflammation in the parts to which they are applied."

Angustura Pseudo-Ferruginæa. Humboldt has given this name to the bark known among the French druggists by the denomination of *Angusture fine*, and which he supposes to be the production of a tree belonging to the genus *bonplandia*, another species of which, the *bifoliata*, according to the same learned traveller, yields the true *angustura bark* (*cuspariæ cortex*) of our Pharmacopœia. According to our author's experiments, and the observations of Emmert, it possesses very powerful poisonous properties, the effects of which are similar to the genus *strychnos* abovementioned, and chiefly reside in a yellow bitter matter which it contains.

Upas-Antiar. This is a yellowish, milky, and bitter juice, which exudes from the tree. M. Orfila repeated the experiments of Majendie and Delile, who in 1809 read a Memoir to the Institute on this poison. His conclusions from them are—

"1. That the *upas-antiar* is very poisonous when it is injected into the carotid artery, the cerebral pulp, or the jugular vein; that it is less so when injected into the pleura, still less when applied to the cellular substance, and least of all when introduced into the stomach.

* See his Memoire sur l'Absorption.

"2. 3. That it is absorbed and carried into the course of the circulation, and acts upon the brain and spinal marrow, which are shown by the loss of sensibility, the severe cries, by the contortion of the head, and by the drawing of the muscles of the face; and, lastly, that it acts as an emetic."

From four to twenty drops were used by M. Orfila in his experiments. Mr. Brodie and Emmert think this poison acts upon the heart, but our author, who quotes them, makes no remark upon this opinion.

Ticunas, or the *American poison*. M. Orfila quotes M. Condamine's account of the composition of this poison, according to whom it is a very compound substance. He does not appear to have made any experiments upon it himself, but draws his conclusions respecting it from those made by Fontana.

Woorara. This poison strongly resembles the last, and is used by the Indians of Guyana for a similar purpose, namely, the poisoning of their arrows. Our author merely quotes the experiments and conclusions of Mr. Brodie respecting it.

Camphor. Our author made many experiments, and quotes several authors, with the view of throwing light upon the nature of the action of this substance. The results, however, do not seem very satisfactory, further than they appear to show that this principle acts in some manner upon the brain and nervous system, and is capable of exciting local inflammation. What is singular, artificial camphor appears to exert no similar action upon the nervous system, but its effects are merely local.

Menispermum Coculus. Coque du Levant. M. Goupil's experiments on this poisonous substance, quoted by M. Orfila, show that it is not only a poison to fishes, but also other animals, and probably man. The kernel of the seed contains the poison, and the flesh of fishes which have been poisoned with it, is likewise highly poisonous. M. Orfila concludes from his own experiments that its action is very similar to that of camphor. The poisonous principle is crystallized, and has been called by M. Bouillay *picrotoxine*.

The poisonous Fungi. Our author enters at considerable length into the description of these poisonous plants, and

quotes likewise many examples of their poisonous effects. He seems, however, to have made few, if any, experiments with them himself, and he draws no conclusion respecting their mode of action.

Alcohol. M. Orfila's conclusions from his own experiments and the observations of others, respecting the action of this fluid, are—

"1. That alcohol operates upon dogs, cats, and rabbits, the same as upon man.

"2. 3. 4. That it acts more energetically when taken into the stomach, than when injected into the cellular substance; but that it is most active when injected into the jugular vein. That its action commences by first exciting the brain, to which excitation coma and insensibility succeed. That its first effects result from the action which it exerts upon the extremities of the nerves, and which is propagated to the brain, but that it is nevertheless at length absorbed.

"5. That there is no identity, as has been pretended, between the action of alcohol and opium. A. Opium does not act till it is absorbed, and is much more active when injected into the cellular substance of the thigh, than when introduced into the stomach, because it is more quickly absorbed. Alcohol, on the contrary, as it acts upon the extremities of the nerves, produces its effects more rapidly when introduced into the stomach, than when applied to the cellular substance of the thigh. B. Alcohol uniformly produces an increased degree of excitement in men and dogs, of various duration, to which succeed coma and great insensibility. Opium, on the contrary, first produces drowsiness, always accompanied by paralysis of the hinder extremities, and which is soon followed by severe convulsions, so that the animals die in a real state of excitation. C. Opium does not inflame the texture of the stomach, which alcohol does in a high degree."

Our author quotes the conclusions of Mr. Brodie, respecting the action of alcohol, which do not differ much from his own. Two experiments made upon dogs with sulphuric ether both proved fatal.

On the effects of carbonic acid gas and carbonic oxide our author offers nothing new. After slightly noticing some poi-

sonous plants, he concludes his account of the individuals of this class with a few observations upon the deleterious effects of strongly scented plants upon the animal economy. He seems, however, inclined to refer them in most instances to idiosyncrasy, or nervous susceptibility, which is extremely probable.

Our author now gives a summary view of the symptoms produced by this class of poisons; but as they greatly resemble what we have before quoted, or at least offer nothing characteristic of the class, we shall omit them. The same remark may be likewise made of the effects produced by them, and observable after death. The mode of action of the different substances seems, however, to be different, and to require different modes of treatment; thus the means recommended of counteracting the effects of the *belladonna*, *datura stramonium*, *tobacco*, *digitalis*, *anagallis arvensis*, *aristolochia clematitis*, the different species of *hemlock*, *rose laurel*, and *rue*, are in the first place, to procure vomiting by the exhibition of 20 or 30 grs. of ipecacuanha in a little water, by tickling the throat with a feather, &c. or, if some time has elapsed, to administer an active purgative, and afterwards, if congestion of the brain be denoted, to have recourse to blood-letting from the jugular vein. Acidulated drinks may be now given with advantage, and the usual means must be had recourse to, in order to remove the nervous or inflammatory symptoms that may remain. When the poisonous substance exhibited, has been one of those which produce asphyxia, such as the *strychnos* tribe, the *ticunas*, *woorara*, *upas-antiar*, *camphor*, or *menispermum cocculus*, besides the usual means, tracheotomy, and the inflation of the lungs with air, will be necessary; and in case the poison has been communicated by a wound, the application of a ligature, and deep cauterization of the wound are proper. When one of the *fungi* is the poisonous substance, M. Orfila recommends, after it has been removed by emetics and purgatives as usual, the exhibition of sulphuric ether, and the common means of obviating inflammatory or nervous symptoms, if they occur. When dangerous symptoms follow the use of alcohol, and other spirituous liquors taken in excess, the use of an emetic, and afterwards acidulated drinks are recommended. Bleeding also may be necessary in the young and plethoric,

with irritating clysters, and washing the whole body with vinegar. In cases of asphyxia by carbonic acid gas, &c. the usual means resorted to are proposed, which we do not think it necessary, therefore, to repeat here.

CLASS VI. *Septic, or putrefying poisons.* This class is intended to include those poisons which produce general debility, a dissolution of the fluids, and syncope, but which in general do not affect the intellectual faculties. Under this head are arranged by M. Orfila *sulphuretted hydrogen*, *venomous animals*, as different species of *vipers*, the *crotalus*, or *rattlesnake*, the *scorpion*, different species of *spiders*, the *bee*, *wasp*, *hornet*, &c. Poisonous fishes, as the *clupæa trhyssa*, the *coracinus fuscus major*, the *coryphæna hyppurus*, the *scomber maximus*, *muscles*. The poison of the *malignant and contagious pustule*, and the poison of *hydrophobia*.

Sulphuretted hydrogen. Our author, after giving the chemical characters of this gas, relates several experiments and observations made by himself and others upon animals. According to Chaussier, whom he quotes, the general symptoms it produces are convulsions, violent spasms of the abdominal muscles, great anxiety, unequal and intermittent pulse, respiration sometimes accelerated, sometimes retarded, dimness of the eyes, and a sensation of cold in the ears. His conclusions are—

"1. That sulphuretted hydrogen, either in its gaseous state, or in solution in water, proves powerfully poisonous to all animals. The gas is most active when respired, less so when introduced into the pleura or jugular vein, and still less when applied to the cellular substance, or taken into the stomach or intestines. That when applied to the skin its action is less rapid, and, as M. Nysten observes, its action is stronger the smaller the animal, so that a man can without inconvenience make use of sulphuretted baths, provided he does not remain too long in them, and that the gas does not enter the lungs.

"2. 3. That it is absorbed entirely, without undergoing decomposition; that, carried into the course of the circulation, it produces a general debility, an alteration in the texture of the organs, especially in the nervous system, and probably in

the composition of the blood. But that it may nevertheless be injected in small quantity into the veins without proving fatal.

"4. 5. It does not produce death by distending the heart, it being very soluble in the blood; and, lastly, that it acts upon man in the same manner as upon animals."

M. Orfila recommends in cases of asphyxia produced by this gas, the means usually had recourse to in similar affections from carbonic acid gas. When it abounds in any confined place, fumigation with chlorine may be employed.

Some experiments are here related which were made with the view of ascertaining the effects of putrid matters upon the animal economy. These, however, were not sufficiently numerous to decide the point in question, which our author intends to prosecute and present to the public in a separate work.

Venomous animals. These are divided into three classes, 1. Those who possess a reservoir of poison, and whose bite is dangerous and sometimes mortal. 2. Those who possess no such reservoir, but whose flesh, when eaten, produces dangerous consequences; and 3. Those whose fluids *have been perverted* by previous disease, and which are capable of exciting diseases in others by contact.

The first of these divisions includes all the serpent tribe, with the poisons of which our author does not appear to have himself made any experiments. He quotes, however, very largely from Fontana, Russell, Home, and others; but as the works and observations of these authors are in every body's hands, we do not think it necessary to notice them here.

Poisonous insects, including the *scorpion*, *spiders*, &c. are next treated of by our author, but he offers nothing new on the subject.

The second section includes, as we imagined, those animals whose flesh proves poisonous when eaten. These consist chiefly of various species of *fish*, and more especially *muscles*. On this subject M. Orfila offers nothing original, but, as usual, quotes largely from all the best authors who have written on it. He inclines to the opinion of those who believe that the poisonous properties of those animals depend very often upon their being in a state of putrefaction. He thinks also that in

some instances their effects must be ascribed to idiosyncrasy. To both these opinions we subscribe in part. We think it proved beyond a doubt that the poisonous effects of fish often depend upon some morbid or putrefactive state of their fluids. We think it also proved that some individuals are much more susceptible of the effects of these morbid changes than others. But we do not believe that the deleterious effects of those fish, which appear to be poisonous at all times and to all persons, can be referred to either of these causes.

The third section includes animals whose fluids are rendered poisonous by previous disease.

Pustule maligne, bouton malin, puce maligne. Malignant pustule. Many instances of this affection are quoted from Enaux and Chaussier, and others. Our author supposes that it depends upon a septic poison formed in diseased animals and putrid animal substances, and capable of infecting the healthy by inoculation, or application to an absorbing surface. Butchers, tanners, veterinary surgeons, &c. are therefore particularly liable to it, as are likewise anatomists. The symptoms of this affection are often violent and dangerous, and are detailed by our author on the authority of others, but he has himself added nothing new on the subject.

Rabies. On this important subject our author likewise adds nothing new, but he presents us with a valuable collection of observations from others respecting it. Spontaneous rabies takes place generally in the carnivorous animals, and sometimes even in the human subject; very rarely in the ruminating animals; to which the poison, however, can be readily communicated by inoculation. Spontaneous rabies has been ascribed to bad food, hunger, great fatigue under a burning sun, the presence of worms in the stomach, keen passions, fright, &c. but it is evident that neither of these causes is sufficient to produce it at all times, and therefore can be only supposed to predispose to the affection. Spontaneous rabies does not differ essentially from communicated rabies, which is the most common form of the disease. The symptoms of the disease, and the appearances found after death, are quoted from Enaux and Chaussier, Dupuytren and others, and are well worth the attention of the physiologist.

Our author now enters upon the mode of treatment to be adopted in cases of poisoning by venomous animals.

Serpents. The first remedy noticed is the *guaco*, a plant observed by Humboldt to grow spontaneously in the plain and valleys of *Rio de la Magdalena*, *Rio Cauca*, *Choco*, &c. in New Granada and other places. Of the effects of this plant, both as a preventive and cure to the bites of serpents, the most extravagant notions are entertained by the natives. Humboldt himself supposes that the smell of the plant is particularly offensive to the serpent tribe, and he relates some circumstances which seem to countenance this opinion. Our author next proceeds to examine the other remedies which have been proposed by various authors, and he concludes by giving a summary view of the mode of treatment to be adopted in these accidents. This consists chiefly in applying, if possible, a ligature above the wounded part, which is directed to be cauterized, either by the actual or potential cautery, and afterwards dressed with a liniment composed of oil and ammonia. Internally such means as promote perspiration and sleep, and are calculated to obviate distressing symptoms, are recommended.

For the bite of the *scorpion*, the internal use of ammonia and the external application of emollient fomentations, &c. are recommended. For the bite of *spiders*, brine, *theriac*, and vinegar, may be employed. For the bite of the tarantula, such means as are calculated to remove inflammation and swelling; and, for the sting of *bees* and *wasps*, the application of brine, or solution of the acetate of lead, &c.

The effects of poisonous *fish* and *muscles* are best obviated by first administering emetics and cathartics, and afterwards sulphuric ether upon sugar, with some antispasmodic. The drink should be acidulated with vinegar. If inflammation occurs, it of course should be obviated by the usual means.

In the *malignant sore* occasioned by putrid substances, the application of caustics, and those means calculated to produce healthy suppuration and obviate gangrene, are recommended. In the last stage, internal tonic and antiseptic remedies may be useful. Bleeding, and all those means calculated to produce debility, are hurtful.

Respecting the cure of *rabies*, our author concludes, after

taking a cursory view of the numerous remedies which have been recommended, that there is at present none known on which we can depend, and that the only means of counteracting the dreadful effects of this complaint is to cauterize the part as soon as possible.

There is an Appendix to this section in which some objections are answered, and some further remarks made, on different subjects treated of in the former part of this work. The first of these subjects is the *corrosive sublimate*, which has been denied by Dehorne to be absorbed. Our author, however, brings forward facts to prove that not only this salt, but also *artificial cinnabar* and *sulphuret of arsenic*, act as poisons when applied to the cellular substance, and consequently are absorbed. Sugar, in a former part of this work, was stated by M. Orfila, chiefly on the authority of Duval, to be an antidote to the poisonous effects of *verdigris*, but he has since been induced to change his opinion, though he thinks it may prove very useful after the poison has been expelled by vomiting. Albumen seems to be one of the best antidotes to verdigris. Many experiments are related which were made with the view of ascertaining the effects of charcoal, as an antidote to different metallic poisons, but the results are unfavourable to this opinion, and our author concludes that "charcoal possesses no particular advantage in cases of poisoning by corrosive sublimate, arsenic, verdigris, and probably other metallic salts," as stated by M. Bertrand. Some observations from Humboldt are here quoted respecting the *curare*, a poison used by the inhabitants of the neighbourhood of the Oronoko.

Some objections having been made respecting the operation of tying the œsophagus, so often had recourse to by our author, he here enters into a defence of that practice, and he concludes from his experiments, that the operation well performed, though it proves ultimately fatal, is not capable of killing, or even much incommoding an animal in two days, and that after death no injury is discovered on opening the body. Hence it cannot, according to him, much interfere with the action of a poisonous substance which speedily proves fatal, and he even attempts to prove that it is indispensable for

studying properly the effects of a poisonous substance. On this subject we have already given our opinion.

Sect. II. We come now to the second section of the entire work, which is a sort of recapitulation of the first, and in which the subject of poisons is treated in a general manner. In the first chapter M. Orfila considers the proper means of verifying a case of poisoning. The second chapter treats of *slow* poisoning.

The first chapter is subdivided into six heads. 1. Of the diseases which are liable to be confounded with acute poisoning. 2. The means by which the nature of the poisonous substance can be ascertained. 3. Experiments upon living animals, considered as a mean proper to verify cases of poisoning. 4. The means proper to distinguish if the poison has been introduced into the alimentary canal during life or after death. 5. The poisoning of several people at the same time; and, 6. Poisoning in cases of suicide or homicide. The diseases treated of under the first head, which may be mistaken for poisoning, are *indigestion*, *cholera*, *black-vomiting* and *diarrhœa*, *malignant fever*, &c.; the nature of each of which affection is briefly treated of, and the characteristic symptoms pointed out as far as they will permit. Many of these, however, especially in *cholera* and *malignant fever*, so strongly resemble the effects of certain poisons, that the nature of the affection can hardly be distinguished by them, but must be ascertained, if possible, by the circumstances of the case, and such other particulars as can be collected. The second head contains an epitome of the physical and chemical properties of the different organic and mineral poisons, arranged under different heads, and, when they will admit of it, in a tabular form. We briefly detailed these as we proceeded, and therefore shall not repeat them here; besides, this valuable part of our author's work will hardly admit of an analysis, and we are therefore under the necessity of referring our readers to the work itself. The other subdivisions of this head relate to the indications which the physician may draw from the symptoms during life, and the lesions found after death. Upon both these subjects our author offers very excellent remarks, and, in the third subdivision, he gives from Chaussier the best

modes of examining the different organs. Our author closes with some general conclusions, one or two of which we shall quote.

"That the physician cannot pronounce a person to be poisoned, unless he can unequivocally demonstrate the existence of the poisonous substance, either by chemical analysis or its physical properties. That in a case when the poison has been too minute to be discovered, but in which the morbid state of the alimentary canal and other circumstances tend to show that the person has been poisoned, the physician ought to intimate to the magistrate, that although the circumstances are in favour of the supposition that the person is poisoned, yet that the *actual proof* of the poisoning is wanting."

A recapitulation now follows of the effects of tea, wine, &c. upon various poisonous substances, and the modes in which they influence the operation of tests. On the third head some judicious remarks are offered upon experiments made upon living animals, the cautions necessary in conducting them, and the degree in which they are to be appreciated. On the fourth head are given the results of several experiments, which demonstrate, that poison introduced into the body some time after death produces effects which cannot be mistaken for those which it produces in the living body. Even if the poison be introduced immediately after this event, its effects are local, and confined to the parts with which it comes in contact.

The second chapter of this section on *slow poisoning* is short and unsatisfactory, and consists chiefly of cases selected from other writers. We think it had been better omitted, as it reflects no credit upon the author.

In closing our remarks upon this work in general, we must observe that the second volume is much less perfect than the first, a circumstance to be referred no doubt to the nature of the substances treated of, most of them being organic products. M. Orfila, who, we understand, is now visiting a foreign country, with the view of prosecuting his subject, is certainly entitled to the highest praise for his industry and perseverance, and we allow him the merit of having produced the best work on toxicology that has yet appeared, and which we recommend, therefore, to the careful perusal of every one

interested in the subject; but justice compels us to say that we do not think the information gained, especially in the present volume, to be in any degree adequate to the lives of so many hundreds of poor animals cruelly sacrificed on the occasion.

An Account of Two successful Operations for restoring a lost Nose from the Integuments of the Forehead, in the cases of two officers of his majesty's army; to which are prefixed historical and physiological remarks on the Nasal operation, including descriptions of the Indian and Italian methods. By J. C. Carpue, Member of the Royal College of Surgeons of London, and formerly Surgeon to the York Hospital, Chelsea. *With engravings by Charles Turner, illustrating the different stages of the cure.*

[From the Annals of Medicine and Surgery, for June, 1816.]

Our readers, we suppose, are well aware, that it was known ages ago, that different wounded parts, if brought together, would unite, and even if one were completely detached. The Indians have made new noses from the skin of the forehead time immemorial. They were made in Italy above three hundred years ago. Both Greeks and Romans were acquainted with the possibility of adhesion among parts either originally or accidentally separated. Y.t from the slow progress which surgery till lately made, from the irregularity with which surgical education was conducted, and from the detached and unconnected situation of surgical practitioners, low in society, deficient in education, and therefore not constituting a republic, as they do at present, the practice of uniting parts, whether for the cure of wounds and the supply of deficiencies seems to have been known and followed, and again forgotten from time to time. Even in France at this time, few surgeons can be induced to heal a wound by the first intention, and every old English surgeon recollects when a piece of half detached scalp was cut off, instead of being laid down. M. Hunter and Duhamel made several experiments upon animal engrafting,

and from that time more and more progress has been made in uniting parts; although it is quite clear that nothing is now done in this respect that was not done long since, but what is now done is done systematically, and forms a part of regular surgical knowledge; whereas before it was done irregularly, and almost accidentally. A case was lately mentioned in the Edinburgh Medical and Surgical Journal, in which half of the left index, which had been separated by an axe, dropped in the dirt, and grown cold, united perfectly with the stump. But Garengeot, nearly a century ago, performed an exactly similar cure upon a man's nose.

"A soldier of the regiment of Conti, coming out of l'Epée Royale, from an inn in the corner of the street Deux-Ecus, was attacked by one of his comrades, and in the struggle had his nose bitten off, so as to remove almost all the cartilaginous part. His adversary perceiving that he had a bit of flesh in his mouth, spit it out into the gutter, and endeavoured to crush it by trampling upon it. The soldier, who on his part was not less eager, took up the end of his nose, and threw it into the shop of Mr. Golin, a brother practitioner of mine, while he ran after his adversary. During this time Mr. Golin examined the nose which had been thrown into his shop, and, as it was covered with dirt, he washed it at the well. The soldier returning to be dressed, Mr. Golin washed his wound and face, which were covered with blood, with a little warm water, and then put the extremity of the nose into this liquor, to heat it a little. Having in this manner cleansed the wound, M. Golin now put the nose into its natural situation, and retained it there by means of an agglutinating bandage and plaster. Next day the union appeared to have taken place, and on the fourth day I myself dressed him, with M. Golin, and saw that the extremity of the nose was perfectly united and cicatrized."—*Traité des Operations de Chirurgerie*, Vol. iii.

Very lately we have heard of a case in the twelfth volume of the *Dictionnaire des Sciences Medicales*, in which the arm of a soldier, completely struck off at the battle of Arlon, excepting a small piece of skin with subjacent artery and nerves, was united. The cure took up eight months; bone and muscles united, and the skin cicatrized. The limb continued some time

feeble and benumbed, and became inferior to the opposite arm in size, but the man was able to resume his rural occupations, in which he had been engaged before going into the army.

Before describing his cases, Mr. Carpue fills a number of pages with physiological remarks upon union by the first and union by the second intention, but there is nothing in them but what is universally known.

In the first of Mr. Carpue's cases, an officer had acquired a very mutilated state of nose by the abuse of mercury, exhibited for a liver complaint.

"Having well ascertained the size of the graft required, by means of a wax model, which I had then flatted and laid on the forehead, I drew the outline round it with red paint. I drew lines also on the sides, where I was to make the incision, and a line beneath for the septum. This done, the patient leaped upon a table, and laying himself upon his back, with his head supported by a pillow, refused to be held, saying, "I hope I shall behave like a man." Nor did he make the smallest complaint during the operation.

"I now made an incision on the right, and then on the left, and dissected out a sufficient quantity of face, with some muscular fibres of the *compressor nares* (*compressor narium*, but this is Latin) and the *levator* and *depressor labii superiores* (*superioris*, but this too is Latin) *alæque nasi*, to receive what was to be dissected from the forehead. I made a simple incision for receiving of the septum, considering that the inner part of the integuments would certainly unite with the upper part; and that if, when adhesion took place on the upper part of the lip, hairs should grow on the lower part of the integuments intended to form the septum, and the old and new parts in consequence should not unite, I could then, with greater safety, dissect the roots of the hair from the part, and bring it into contact with the lower part of the incision. My apprehensions appeared ultimately to have been groundless; for both surfaces readily united, and an excellent septum was formed.

"The parts of the face being prepared for the reception of the new nose, I began that part of the operation which belongs to the forehead, by making an incision along the lines I had drawn. I then dissected the integuments, merely leaving the

pericranium. The angular artery, on the left side, bled freely, but the loss of blood was very inconsiderable, and there was no occasion for tying the artery. The part which was dissected, and which hung down, became of a purple colour, and the patient at this period informed me that his forehead felt extremely cold. I applied warm sponges, which afforded great relief, and which were continued during the remainder of the operation.

"My next step was to make the *turn* of the dissected parts, and introduce the septum into the incision of the upper lip, where I confined it by ligature. After this, I brought the integuments exactly into contact with the integuments on the left side, and fixed them also by two ligatures, and then I did the same on the right. I introduced lint to distend the nostrils, and applied straps of adhesive plaster to keep the integuments in contact. Every thing being thus done for the nose, my concluding care was to bring the edges of the integuments on the forehead, and between the eyebrows, as near together as possible, and keep them so by means of adhesive plaster."

On the third day the dressings were removed, and adhesion discovered in every part. The new nose was flat, and rose and fell with every inspiration and expiration. On the ninth day, it became œdematous, but in about a month decreased in size. Five months after the operation, the portion connecting it with the forehead was divided—the postponement of which division constitutes the only difference between the Indian operation and Mr. Carpue's. After the œdema had subsided, the nose became flat, but granulations formed within, and it acquired a gradual enlargement and proper distention, notwithstanding it was supported by no bone nor cartilage.

The second case occurred in Captain Latham, who lost part of his nose in the battle of Albuera. The operation in this case was similar to the first in its nature and its success. Mr. Carpue has the merit of being the first in this country who performed a simple operation, performed indeed, before, innumerable times abroad, and in every respect similar to little operations which every surgeon among us performs every day, viz. the approximation of parts, that they may unite by

the first intention. He has shown no superiority of knowledge or of skill, but he has shown spirit, and that is unquestionably a merit. If Mr. Cline or Mr. Cooper had by chance performed the operation, instead of Mr. Carpue, they would perhaps have published an account of it in some periodical publication, filling at the utmost a couple of pages.

ORIGINAL REVIEWS.

FOR THE ECLECTIC REPERTORY.

Vegetable Materia Medica of the United States; or Medical Botany: containing a botanical, general, and medical History of Medicinal Plants indigenous in the United States. Illustrated by coloured Engravings, made after original Drawings from Nature, done by the Author, William P. C. Barton, M. D. Professor of Botany in the University of Pennsylvania, &c. &c. Philadelphia, printed by Mathew Carey & Son, Sept. 1, 1817. 4to, No. 1. pp. 76.

From the animal, vegetable, and mineral kingdoms the practitioner derives the various articles employed in medicine. Without any disparagement, however, to the animal and mineral substances, it will be readily conceded that the materia medica receives the largest supplies from the vegetable kingdom. In the systems of Lewis, Cullen, and Murray we have a full exposition of the materia medica, agreeably to the state of the science at the period in which the respective authors wrote. But the botanical description of the plants employed in the cure of diseases constituted no part of the plan of those works. It has been our misfortune, and we believe it has occurred to others, to experience considerable difficulties in the attempt to procure certain medicinal plants not common in our shops, yet growing within the circuit of a short walk. Among the various synonymes, the familiar names, by which plants are designated in a particular section of country, may be unintelligible where the inquiries are made, and verbal descriptions are often found to convey very inadequate information. To express the characters of the various indigenous plants employed in medicine, and to illustrate the descriptions with appropriate engravings, will be, therefore, considered as a very acceptable work.

In describing the plants Dr. Barton has adopted the follow-lowing plan. He first gives the systematic name; next the fa-

miliar or popular appellation; after which follow the names by which the plant is occasionally known. He then refers to the authors who have noticed the plant. The generic character follows, together with a reference to the natural system of Jussieu, the natural order of Linnæus's natural method, and the class and order of the artificial system of this author. We are then presented with the specific character, the synonymes, and a short notice of the pharmaceutical preparations of the plant, its various properties, its medical uses, and doses.

The descriptio uberior is drawn from the Flora Philadelphica, a work which he promises to publish at no great distance of time. The text contains a familiar description of the plant, calculated for the generality of readers, the chemical analysis, where any has been published, then a history of the medicinal properties, some notice of the economical uses; and the history is completed by an explanation of the plates, and the dissections of the flowers and fructifications.

In the engravings, those who may not be familiar with the science of botany will readily identify the respective plants. The professor's great skill and taste in drawing have enabled him to execute this part of the work with uncommon success.

The first article contained in this number is the Chimaphila Umbellata, vulgarly known by the names of Pippsissewa, or Winter-green. It grows abundantly in all our forests from Canada to Georgia, and is occasionally met with in Florida. It particularly delights in a loose sandy soil, and thrives most luxuriantly under the shade of trees.

By chemical analysis it affords an astringent matter, which, according to the experiments of Dr. Mitchell, published in his inaugural dissertation in 1803, strikes a dark black with the sulphate of iron. It yields about one third of its weight by maceration in alcohol. This extractive matter contains a portion of gum, which is soluble in water. The plant contains much less gum than resin.

This plant has lately attracted considerable attention, on account of its diuretic properties. It is generally given in the form of decoction, prepared by macerating an ounce of the dried plant, including root, stalk, and leaves, cut small, in a quart of water, for twelve hours, and then boiling till it yield

one pint of liquor. This quantity may be given in 24 hours. From 34 pounds of the recent plant Mr. Carter obtained 4 pounds of extract. This extract is conveniently administered in the form of pill, or it may be given dissolved in a small quantity of boiling water. Of this extract Dr. Somerville gave five scruples in 24 hours. We offer this brief notice of the Chimaphila. For a fuller account we refer to the work before us. The Medico-Chirurgical Transactions vol. V., contain at large the observations of Dr. Somerville and of the late professor Barton. From the reputed virtues of this plant, it ought not to be confined to exciting diuresis. Tinea capitis, and the various forms of scrofula, are stated to yield to this remedy. Its mild tonic properties render it particularly adapted to the last stage of consumption, and it has accordingly been recommended in this disease. The trials we have witnessed were too short and imperfect to justify our offering a positive opinion respecting the efficacy of the Chimaphila umbellata in that so generally fatal disease.

Sanguinaria Canadensis. Blood-root. Puccoon. Besides the beautiful red dye imparted by this plant, it is endowed with properties which entitle it to a place in the materia medica. When given in small doses, it is stimulant, diaphoretic, and expectorant. In doses of fifteen or twenty grains, it proves emetic. The powder creates irritation in the fauces, on which account it is directed to be given in the form of pill. This acrimony of the Sanguinaria Canadensis seems to render this article objectionable, when it is the intention of the practitioner merely to excite vomiting, as the slow solution of the pill must cause the operation of the medicine to be protracted beyond the period corresponding with the indications where emetics are administered. The hint offered respecting its anthelmintic properties may not be unworthy of notice. The slow solution of pills will occasion the article to be more diffused through the intestinal tube, whereby it will more completely act upon the parasitical animals intended to be dislodged. According to the observations of Dr. Downey, the leaves and seeds are deleterious. The seeds producing effects analogous to those observed from the seeds of the stramonium.

The season for collecting this plant for medical purposes is when the seeds are ripe, which is about the beginning of May.

Cornus Florida. Dogwood. This is the largest shrub growing in our forests. From the size it frequently attains, it seems well entitled to be classed among the trees, and has been raised to that rank by Michaux, in his elegant work on the forest trees of North America. The astringency and bitter taste, so obvious in this plant, are calculated to bring it into notice as a tonic. It has been famed for its virtues in the cure of intermittents: but it has acquired this character rather from popular report; few practitioners having been in the habit of employing it. The only testimony which has been collected is that of Dr. Gregg, of Bristol, on whose authority it is stated not to be inferior to Peruvian bark, in the cure of intermittents, nor inferior as a corroborant, in all cases of debility.

Dr. Barton considers that, " as a tonic, the powdered bark of the Cornus Florida is well entitled to the notice of physicians, and that it may certainly be recommended as a good substitute for the cinchona, particularly as that which now fills the shops is seldom genuine, but adulterated by oak bark, and frequently altogether a factitious article." He further remarks, " that its superior miscibility, or solubility in water, to the Peruvian bark, may occasionally render its use more convenient than this last substance."

Triosteum Perfoliatum. Fever root. Red flowered Fever root. The root reduced to a power, and given in the dose of 20 or 30 grains, operates as a gentle cathartic. Larger doses will excite vomiting. This emetic property is the only one noticed by Schœpf, and has obtained for this plant the popular name of bastard ipecacuanha. The author of the Medical Botany states that " the part of the plant used for medical purposes is the cortex or bark of the root. When the root is dry, it is brittle and is easily pulverized. Perhaps it is not necessary to separate the bark from the ligneous part; for in all likelihood the whole root is endued with the same medicinal property. The autumn is the proper time for collecting the plant."

The berries are stated, on the authority of Dr. Muhlenberg, to have been used as a substitute for coffee; and wild coffee is an appellation sometimes given to this plant.

Two other articles, the Gillenea Trifoliata and the Gillenea Stipulacea, are introduced into this number. They are stated to be endowed with emetic properties, and may be occasionally substituted for the ipecacuanha of the shops, though they are scarcely entitled to a preference.

FOR THE ECLECTIC REPERTORY.

Memoir on Angina Pectoris, which obtained the prize at the meeting held by the Medical Society of Paris, on the 31*st of October* 1809, *and which was awarded on the 2d of February* 1813. By L. JURINE, corresponding member of the National Institute.

[Translated from a Review by Sené.]

THIS memoir treats of a disease scarcely known more than fifty years, and which has given rise to great diversity of opinion respecting its existence as a purely spasmodic affection. Some, at the head of whom we may place Heberden, Hamilton, Macbride, Darwin, Desportes, have not scrupled to assign it this character, admitting, however, that it is capable of being more or less complicated. Others, as Parry, Bostock, Jenner, have considered it as dyspnœa symptomatic of an organic affection of the heart or the great vessels, and particularly of an ossification of the coronary arteries. To these causes Fothergill added excessive obesity, a great accumulation of fat in the chest, or a collection of water in that cavity or in the pericardium. Others, setting aside all idea of an essentially distinct disease, have supposed that the angina pectoris was only a modification, sometimes of spasmodic asthma, sometimes of irregular gout or rheumatism, and that the records of both the ancients and moderns contained innumerable cases of this kind, which would afford grounds for admitting a new species of disease with as much propriety as those which formed the basis of the theory of Heberden and his followers. To this class belong the works of Berger, Elsner, Butter, Macqueen; and such is apparently the prevailing doctrine in France.

The hypothesis of Heberden has lately received additional support in the very respectable authority of Jurine, a distin-

guished practitioner in Geneva, to whose memoir on the angina pectoris the prize was adjudged, about two years ago, by the Medical Society of Paris.

"Agreeably to the conditions proposed by the society, it will be necessary to offer a description of the disease known, especially among the English physicians, by the name of *angor pectoris* and angina pectoris: to explain the causes which produce it; to point out the authors who have written on the subject; and to indicate the diseases which resemble it, the affections with which it may be combined, and to which it gives origin."

In compliance with these conditions, Dr. Jurine has divided his memoir into three chapters. In the first he gives the synonymes, the definition, and description of angina pectoris; in the second he treats of the symptoms, causes, prognosis, and method of cure. The third offers a collection of observations on angina pectoris both simple and combined, and on the diseases which bear it any affinity.

The author next assigns the order in the nosological table which, according to him, is adapted to angina pectoris. His work closes with some remarks on the authors, ancient and modern, who have written on this disease. At the end of his memoir he has comprised, under the title of appendix, or post scriptum, &c. some very interesting remarks on the observations or works, lately published, having reference to this subject.

Chap. I. *Denomination, definition, and description of angina pectoris.*—The names given to this disease bear the impression of the hypotheses entertained by their respective authors. Thus Sauvages calls it *cardiagmus cordis sinistri;* Elsner *asthma convulsivum;* Butter *diaphragmatic gout;* Schmidt *asthma arthriticum*, &c. Some of these names are derived from some predominant symptom, such as *angina pectoris*, the appellation given by Heberden, *syncope anginosa* by Parry, and *sternalgia* proposed by Baumes.

The definitions given of angina pectoris have differed no less than the names by which it has been designated. Dr. Jurine defines this disease "a painful and distressing constriction felt across the chest, excited by walking, and soon subsi-

ding on rest, and not then accompanied by palpitations, irregular pulse, nor oppression; but solely by a slight impediment in breathing."

Rougnon of Besançon appears to be the first who considered the disease as constituting a particular species: but to Heberden we are indebted for the full exposition. He first pointed out the pathognomonic symptoms, the suddenness of the attack, the acute pain in the sternum, the sense of constriction and distress in the chest which always accompanies it, the extreme danger of the disease, the immediate disappearance of all the symptoms when it does not prove mortal, &c., from which circumstances he was induced to class it among the spasmodic diseases.

The tract published by Elsner, in 1778, appears to have been rather a compilation than the result of the author's experience.

Butter, in 1791, considered the disease as gout affecting the diaphragm. In the description he has given he has added little to the observations of Heberden. He has, however, marked with precision the precursory symptoms, as the heat in the chest, which gradually increases, the flatulence of the stomach and intestines, the darting of the pain from the sternum towards the ribs and up the neck, where it produces a sense of suffocation, the manner in which respiration is affected during the paroxysm, and which, to use his expression, "is rather a tightness and sense of fulness in the chest than a real difficulty of breathing."

If this description possess not sufficient clearness and precision, that of Dr. Parry is more perfect. He has remarked that angina pectoris attacks more frequently men, especially those who are corpulent; that it is more frequently observed in those of forty years and upwards, which accords with the observation of Heberden; that the first symptom is a pain in the sternum, extending commonly from the centre of that bone to the left side of the chest, and continuing to the left arm, a little above the elbow; sometimes, though rarely, to the right side, and even as far as one or even both hands; that the moment the patient feels this pain he is seized with the fear of instant death, and desists from exercise, &c. He has observed that

during the paroxysm the pulse is most frequently but little affected in point of regularity; nevertheless he believes that it may be more or less feeble according to the violence of the attack; moreover, that a return of the paroxysms has been caused by walking after a full meal, by strong emotions of mind, &c.

The description given by Wichmann agrees in many respects with those of Heberden and Parry, only he asserts that the sensation experienced by the patient, and which threatens suffocation, is not a sense of constriction of the chest, but an undefinable sensation which takes away his breath. He adds, that in the cases especially where, from the long continuance of the disease, the pain extends to both sides of the neck towards the lower jaw and ears, the patient feels the parts, as it were, contracted or stretched, and that sometimes the œsophagus appears to him compressed.

Dr. Jurine, taking advantage of the labours of those who have preceded in this career, and corroborated by his own observations, has given a description of simple and idiopathic angina, which we believe we ought to transcribe literally, for fear of altering the sense by attempting an analysis.

"The first attacks of this disease are sudden. The patient is seized, while walking, without any previous indisposition. His respiration appears to be stopped, though not really so. He experiences in the chest a sensation of anxiety and distressing constriction, threatening suffocation if he continues to walk, and compels him to stop. This sensation, more distressing than painful, lasts only a few minutes. After a moment's rest the patient recovers, and again renews his walk without experiencing any uneasiness.

"If the patients endeavour to point out the seat of pain, they describe it as across the sternum, seated higher or lower. If they attempt to explain the kind of feeling, they compare it to a painful pressure on the chest, forcing the sternum in towards the spine. If they wish to mark the period of their attacks, they assert that they are more exposed after taking their meals, when walking rapidly or up a rising ground, or ascending the stairs, or going against the wind.

"The earlier attacks are light and with considerable intervals.

In proportion as they are repeated they acquire more violence and a longer duration; so that in the second period of the disease, the paroxysm is observed to continue for half an hour, an hour, or even longer. Then the seat of pain seems to extend further; and, inclining more frequently to the lest side, affects the arm just below the insertion of the deltoid muscle, and also often the forearm and wrist, and even the fingers' ends. In some instances both the upper extremities are simultaneously affected.

"Though this affection of the arms is a common symptom in angina pectoris, instances occur where the pain extends up the neck as far as the lower jaw and the ears. In others the pain descends into the epigastrium.

"When the paroxysm abates, the patients are sensible that the radiating or symptomatic pain, which ever it may be, declines in a course the reverse of that in which it came on. Soon after the pain in the sternum vanishes, and no other uneasiness remains but a slight gnawing in the chest. The eructations, when they occur, which is not usual, announce the termination of the paroxysm.

"In this second period the causes capable of exciting the disease are increased, so that the attack which occurred only in the day time, and from some very obvious cause, comes on during the night, especially after the first sleep; and it is brought on by the least exercise, by a slight fit of passion or inquietude of mind, while passive exercise exerts no such influence

"During the paroxysms the patients preserve sufficient freedom of breathing to draw a full inspiration. Often they feel the inclination, and are heard to sigh deeply. Neither palpitation nor intermission is observed in the pulse. It is corded and rather quicker. The urine is not altered in quality or quantity. The bowels are not moved. Some patients are pale during the paroxysm. Others have the body bedewed with perspiration.

"In the third and last period of the disease, the persons die suddenly; or if this is not the case, the disease is complicated with affections of the lungs, heart, or brain, which I shall not attempt to enumera te

"It is remarkable in angina pectoris, that those affected with the disease enjoy very good health during the intervals. On seeing them no one would suspect them to be affected with a disease eminently mortal. Nothing announces it in their external appearance. They eat and drink and perform all their functions as before. Their sleep is at times disturbed, and they are obliged to be very cautious in taking any active exercise.

"Among the number of persons affected with the disease who have come under my care, as many were of a spare as of a corpulent habit. I have seen but one under the age of fifty; and I have known but one woman who died of it.

As regards the influence of the seasons, or the temperature of the weather, I have not observed any thing which would authorize me to draw any general conclusions."

Chap. II.—*Of the symptoms of angina pectoris, of the cause, of the prognosis, and of the treatment.*—All who have written on angina pectoris have considered the pain in the sternum as a pathognomonic symptom of the disease; but great discrepitancy of opinion prevails respecting the nature, the precise spot, and extent of this symptom. Jurine's opinion is very similar to that of Heberden.

The spot where the pain occurs in the beginning of the paroxysm, the little effect it has on the circulation and breathing, the perfect state of health enjoyed, for a long time, by persons affected with this disease, constitute so many reasons which, in the estimation of Jurine, preclude the possibility of its being connected with the heart, pericardium, lungs, or pleura. Reasoning in this way by exclusion, he is induced to refer this pain to the thoracic plexus of nerves; and he is particularly inclined to this opinion from the manner in which this distressing sensation originates, is propagated, and terminates; the long intermissions, the influence of the passions, and of sleep. The sympathetic effects extended to the upper extremities, the lower jaw, &c.

Writers are still less agreed about the state of the pulse in angina pectoris. Some have often perceived no alteration; others have discovered it to be intermittent and irregular; but nearly all allow that it is feeble and depressed, so as to be scarcely perceptible. Dr. Jurine, who has observed this last

condition, never found it intermittent or irregular. He however states that he never had an opportunity of examining the pulse in attacks which proved mortal. He is of opinion that the pulse is irregular or intermittent in the beginning of angina pectoris only when the complaint is symptomatic of an organic affection of the heart or larger blood-vessels, and that if in the course of the disease the pulse acquires this character, it is owing to the combination with some organic change.

The physicians who have written on angina pectoris do not give the same account of the disturbed state of respiration during the paroxysms; and this is probably owing to the inability of the patients to describe with accuracy sensations so closely bordering on annihilation. Notwithstanding this obscurity in their expressions, it is obvious that the alteration in question is not a true dyspnœa (the cases of complicated disease being excepted) for the patients feel the desire to make a deep inspiration, and have the power of holding the breath, without exciting pain or cough. In the patients who came under the care of Dr. Jurine the respiration was not confined; it was rather more frequent than common.

The eructation at the close of the paroxysm is not a constant symptom.

Having discussed the character of the symptoms commonly *considered* as essential to angina pectoris, Dr. Jurine next enters on the examination of the most important point in the inquiry, viz. the immediate cause of angina pectoris. With this question are connected the numerous hypotheses offered respecting the nature of the disease, whether it be an idiopathic or symptomatic complaint.

We have already noticed the opinion of Heberden, Fothergill, and many other respectable physicians.

Elsner, and after him Schaeffer and Schmidt, considered gout, and occasionally the rheumatism, as the principal causes of this disease. Butter adopted the opinion of Elsner, and made it the more explicit, by admitting that the gout was fixed on the diaphragm.

Wichmann undertook to refute the hypothesis of Elsner. He asserts, as worthy of being remarked, that of thirteen persons affected, whom he had visited, with angina pectoris, none

had the gout. He does not, however, pretend that the two diseases may not exist at the same time.

Baumes admits the ossification of the cartilages of the ribs as among the causes of angina pectoris; and to this alteration Rougnon had ascribed the disease of Mr. Charles: but besides that the ossification of the cartilages of the ribs has been observed only in a few persons who have died of angina pectoris, nothing is more common than the ossification in the bodies of persons advanced in years, without such persons having experienced any inconvenience during life.

Jenner and Parry having met with ossification of the coronary arteries of the heart in the bodies of several persons who had died of this disease, have been led to consider this ossification as the cause; but the coronary arteries have often been observed to be ossified without occasioning angina pectoris; and, on the other hand, the disease has occurred without any ossification of these arteries. The truth of this position is confirmed by two observations of Morgagni (De causis & sedibus Morborum, lib. 2. epist. 24. xvi. & epist. 26. xxxi.) Senac and Corvisart report cases in which the ossification of the coronary arteries of the heart did not occasion the symptoms of angina pectoris.

Dr. Odier of Geneva considers the many cures of angina pectoris effected by himself and others, by means of antispasmodics, as an irrefragable proof that the disease does not depend upon any organic alteration, and that it is a nervous affection of the lungs.

Dr. Jurine, who adopts the opinion of his countryman, moreover adds, that if the heart died first, as we are led to suppose from the theory of Jenner and Parry, the pulmonary vessels should be found collapsed and void of blood, and the left auricle and ventricle filled with blood of a florid colour: but it has been observed that the blood contained in the vessels, whether arterial or venous, was of a dark colour, and did not coagulate after a long exposure to the atmosphere.

We have already presented most of the arguments offered by Dr. Jurine for classing angina pectoris among the nervous diseases. We shall merely recal the attention of our readers to the unexpected attack of the disease, its sudden termination

in the restoration of health or in death, the nature of the occasional causes which induce most commonly a return of the disease, the equality and regularity of the pulse, the freedom in respiration, the distressing sensation extending to the upper extremities of the jaw.

In ranking angina pectoris as a nervous affection of the lungs, Dr. Jurine thinks he can explain the symptoms observed during the paroxysms of this disease.

It is the generally received doctrine among physiologists, that respiration really consists in an alteration in the colour of the blood, effected by the oxygen of the atmosphere, and that this process is exclusively performed in the pulmonary cells. It is supposed likewise that these cells are capable of spontaneous distention, and this is not performed, or but imperfectly, in angina pectoris. The cause of this alteration in the functions of the lungs appears to exist in a decay of the vital powers of these organs, and accordingly this disease occurs only in persons advanced in life. When the lungs have partially lost their powers, the slightest disagreeable impression is sufficient to impede their functions. Dr. Jurine has compared the attacks of angina pectoris, when not intense, to the oppression and necessity of taking breath experienced by an aged person when ascending a hill. Before he can resume his steps, his lungs must recover, by a little rest, sufficient energy to complete the oxygenation of the blood. Our author likewise compares the symptoms of angina pectoris to the effects experienced by travellers, who, like Saussure, have climbed lofty mountains. Their strength soon failed, so that they were in danger of fainting, if they continued to ascend. But what is remarkable, and fully establishes the resemblance between angina pectoris and this kind of fatigue, is, that a moment's rest was sufficient to repair their strength completely.

But how shall we explain that causes so diametrically opposite as exercise and sleep should produce the attacks of angina pectoris? As respects exercise, it is sufficiently evident that the increased activity which it occasions in the circulation accelerates the breathing, and imposes on the lungs greater labour; and that this increased action must, sooner or later,

induce fatigue, which throws these organs into a kind of paralysis. From that period suspension, or great diminution in the chemical phenomena of respiration, whence the disoxygenation of the blood, deleterious influence of the dark coloured blood on all the organs, and principally on the heart and brain; but as soon as the current of blood is retarded the strength and the ability to walk return.

To explain how sleep favours the attack of angina pectoris, Dr. Jurine states, that in persons affected with this disease, sleep appears to suspend, more or less, organic life, so that the chemical phenomena of respiration are more and more diminished, until the patient awakes in a state of anxiety and demi-asphyxia.

The resemblance of the symptoms of angina pectoris to the effects produced in animals in whom Dupuytren, Dumas and Provençal divided the eighth pair of nerves, with the view of ascertaining the influence of these nerves on the changes which take place between the blood and the air in respiration, renders it probable that in both instances death is the consequence of the nervous affections of the lungs.

Dr. Jurine expresses in the following terms his opinion of the causes of angina pectoris.

1st. The immediate cause of this disease is connected with an affection of the pulmonary nerves, which disturbs the functions of the lungs; impairs the oxygenation of the blood; and produces, previous to the attack, the pain in the sternum.

2d. Angina pectoris rarely occurs but in persons whose lungs are weakened by age, or who are of a constitution particularly predisposed to the disease.

3d. The morbid affection of the pulmonary nerves must in time be communicated to the cardiac plexus, and affect the heart and vessels secondarily.

4th. The imperfect oxygenation of the blood lessens its stimulating powers on the heart and lungs, gives rise to reiterated attacks, until this stimulus being exhausted, occasions the death of these organs and then of the brain.

The remedies proposed for the cure of angina pectoris are as various as the speculations respecting its nature. Hence those who, with Heberden, considered it as a spasmodic dis-

ease, have particularly extolled opiates. Elsner recommends the same treatment as in gouty affections. Parry enjoined rest, temperance, and the antiphlogistic regimen. He likewise resorted to opium, laxatives, and tonics, according to the indications taken from the violence of the paroxysm, the state of constipation, &c. Fothergill directed a vegetable diet. Johnstone cites a cure effected by pills of assafœtida, camphor, and the extract of cicuta. Dr. Odier prescribed the strictest antiphlogistic regimen. Professor Baumes speaks in high terms of the phosphoric acid. Others state their having employed with success blisters over the sternum, emetics, electricity, James's powders, &c.

We shall now offer some notice of the practice adopted by Jurine. Convinced that the violence and the danger of the disease depend on the frequency of the paroxysms, he endeavours to ascertain and remove the causes which occasioned the first attacks. He advises his patients to reside in the country; to occupy the ground floor, provided it be dry; to take short airings, especially in a carriage; and to indulge in light readings. Diet consisting of an equal proportion of vegetable and animal food is the best adapted to support the strength of the patients. They may take a little wine at their meals. These, especially the supper, ought to be light. The disordered state which occurs during sleep generally yields to a few grains of Dover's powder. It will be proper to keep the bowels open by means of glysters. The patient ought to be warmly clad; to avoid the damp; and to observe the strictest continence. Dr. Jurine directs them to take three or four times a day valerian root in powder, substituting occasionally the cinchona or some other tonic. Besides these remedies he prescribes the cold bath. If the person has been subject to any cutaneous disease, to rheumatism, gout, &c., he ought to have one or two issues on the thigh, and take antimonials and antispasmodics.

If these means afford relief, in order to complete the cure, they must be continued for a length of time, carefully avoiding every thing that is gloomy.

If the disease increase; if the paroxysms become more frequent, more violent, and of longer duration, there will be reason to apprehend some organic lesion of the heart and the neigh-

bouring vessels. We must then substitute other antispasmodics, and in combination with bitters. Dr. Jurine is even of opinion that the ammoniacal copper, the nitrate of silver, the arsenites of potash and soda may be employed with advantage. When plethora prevails, leeches should be applied to the verge of the anus. If there is any indication of an effusion of serum in the chest, hydragogues and the foxglove should be administered. Lastly, the injurious effects proceeding from a deficient oxygenation of the blood, provided the angina is not complicated with phthisis pulmonalis, may be obviated, according to Jurine, by the inspiration of a mixture of oxygen and atmospheric air.

CHAP. III.—*Of simple and idiopathic angina pectoris; of the disorders produced by it, of those with which it may be complicated, and of the diseases which resemble it.*—This chapter commences with a collection of cases, partly extracted from the most respectable authorities, and partly taken from his own observations; and which Dr. Jurine has brought together with the view of establishing the specific character of idiopathic angina.

The ten first are cases of simple idiopathic angina pectoris; the following twenty-one are cases of angina combined with various lesions of the natural and vital organs. These cases would lose much of their value if we were to attempt any abridgment. We shall therefore refer our readers to the memoir itself. We will only make the following remark: that in many of the cases considered by Dr. Jurine as belonging to simple idiopathic angina pectoris there was no examination of the dead body; and where such examination was made, ossifications and other morbid changes were observed; hence these cases do not appear calculated to establish the original and specific character of the disease. In perusing the cases of angina pectoris supposed to be complicated, many physicians, besides ourselves, will probably find that it is often very difficult to ascertain that these complications are not the disease itself.

Dr. Jurine states that there is scarce any besides spasmodic asthma and the organic lesions of the heart which offer any symptoms resembling in any degree the angina pectoris; and a

careful examination will enable us to distinguish these disorders. Thus, the paroxysms of asthma usually come on in the night; they continue much longer than those of angina; the peculiar nature of the breathing, which is accompanied by a wheezing; the desire for fresh air; the remissions, which are always gradual, &c.; these are so many features by which spasmodic asthma may be distinguished from angina pectoris.

Most of the diseases of the heart produce in the several functions, and especially in the circulation and in respiration, derangements which have been well described by Corvisart; and which must generally remove all uncertainty in the diagnosis.

From what has been already stated we need hardly repeat that Jurine classes angina pectoris among nervous diseases. His arrangement is founded on the following arguments.

"The attacks and termination are always sudden.

"There are long intervals of perfect health.

"The attacks are mostly brought on by some distress or strong emotion of mind.

"The disease may continue for years without materially affecting the health.

"The attacks are rarely occasioned by passive exercise.

"During the paroxysm the pulse is not accelerated.

"The attacks frequently come on after the first sleep.

"The non-oxygenation of the blood evidently announces the influence of the nerves."

Here terminates the task we had undertaken. Every consideration induced us to offer a full analysis of this production of Dr. Jurine; the justly acquired celebrity of the author; the interest naturally inspired by the subject he has treated of; the high character of the judges who awarded him the premium

FOR THE ECLECTIC REPERTORY.

Minutes of Cases of Cancer and Cancerous Tendency, successfully treated by MR. SAMUEL YOUNG, Surgeon; author of a Treatise on Cancer and other surgical works; *with a Prefatory Letter addressed to the Governors of the Middlesex Hospital by* SAMUEL WHITBREAD, Esq. M. P. London, 1816, pp. 170, 8vo.

ANY information on this very interesting subject, must be highly gratifying to the medical practitioner, as well as to the numerous sufferers from a disease, whose cure is generally regarded as hopeless.

The following account of the process employed, comprehends the author's practice, minutely detailed in several successful cases.—In addition to the dressings and pressure, we find that he makes frequent use of digitalis and arsenic.

As the subject appears to have excited much interest in Great Britain, we may expect further accounts of it from thence. The present publication will serve to direct the attention of our medical brethren in the United States to make trial of the remedies proposed for this terrible disease; and if the application of the remedy should be perfected among us, it will be a cause of general congratulation.

"Pursuing the same train of facts, an account of which was published in 1805, under the title of 'An Inquiry into the nature and action of Cancer, in order to establish a principle of cure by natural Separation,' where it was proved, that the disease can only exist under a previously altered and morbid accumulation of structure; but considering the necessarily confined application of such a principle of cure, in a disease so complicated, so variously acting, so indefinite in extent, and so often involving parts necessary to life itself; the idea of a more extended effort for the removal of the disease by *Mechanical Pressure* suggested itself; and so far back as the year 1809, in two cases, it was successfully employed.

"The principle of this practice was found in the obvious facts, which nature is constantly presenting in the operations

of the Animal Œconomy, viz. the removal of parts by absorption, and particularly under the excitement of pressure. It is true such facts were presented through the medium of disease, but the principle was the same, and only required another direction to obtain beneficial and healthy results.

"If by diseased tumours the brain can be absorbed, the bones of the scull removed, or the testis in hernia congenita obliterated, to reverse the powers of absorption seemed feasible. If by diseased pressure healthy structure could thus be removed, why not imitate such pressure, and take advantage of such powers, by directing them to beneficial purposes, and destroy in turn morbidly formed parts or tumours, by the very means with which Nature has furnished them for the destruction of natural structure?

"By such morbid pressure arterial action also is suppressed. Why then should a tumour of the neck, for example, be suffered to proceed in all the licentiousness of disease, destroying on the one hand by its pressure the natural circulation of parts, and on the other exciting the absorption of natural by unnatural structure; when the same pressure *employed* on its own surface would obstruct its growth, and *cause* its own *absorption?* Under this impression, and on the principle that mechanical pressure resists vascular action, and excites the absorbents, it was adopted as a mode of cure for the removal of cancer, and other diseases dependent on previously altered and morbidly accumulating structure. One might enter largely on the more minute operations of this process, in the prevention and restoration of diseased structure; but the present object is simply to give a brief statement of leading facts. There are, however, many curious and important truths, connected with and illustrative of the nature and history of diseases of this class; the detail of which shall be given at some future opportunity.

"The means generally employed to effect the pressure, as stated in the following cases, have been plaster straps, sheet-lead, forming shields of various thicknesses, tin plates, linen compresses, aud the use of appropriate rollers.

"The strength of the application of the pressure has been progressive; commencing in most cases with the use of the

straps only; in some by single, and in other cases by double layers. The force of their application controlled in each instance by the existing circumstances, and the sensations of the patient.

"The plaster should be uniformly smooth; and in the application of the straps it is of the first importance that all wrinkles should be avoided; that an equal surface of resistance should be given. In the direction of specific pressure on a diseased part, all sort of partial stricture must be avoided, according to the common principles of surgery, which may be illustrated by the now common treatment of an ulcerated leg, after the admirable plan of Baynton. Here the ulcer of the leg is specifically compressed, although general pressure is also given to the limb, by the use of the roller. So a scirrhus of the breast may be specifically compressed, by the use of the pressure plates, and the adjustment of the linen compress, including at the same time, a general pressure of the whole.

"Almost every case will present varieties, and the practitioner always carrying the principle and object of cure in view, must have recourse to his own judgment and resources, to meet the exigencies of complicated cases. Generally speaking, the application of pressure has been found to relieve pain, and that in the most exquisite and actively painful states of cancerous affections.

"After several trials, the best composition for the plaster-straps, has been found in equal parts of the common strengthening and soap plasters mixed, and spread, somewhat thickly, on linen.

"A plaster so composed, has elasticity, consistency, and durability, which the common adhesive plaster does not possess; and what is more material still, none of its irritating qualities. It may be used in a diseased and tender state of skin, where the adhesive plaster in practice would inevitably produce irritation and extensive ulceration.

"It is to be noted, that in cases of ulceration, where a dry scale or thick incrustation is formed, an increase of discharge is no reason for the discontinuance of the applications. In such cases, an increased discharge is the constant attendant upon the restoration of parts under pressure. In all such cases,

and where the skin is tender, shining, partially broken and diseased, the parts should be well charged and dusted with chalk, or hair-powder, or both. In all cases the straps should be long and commanding. Irritable points and parts should be defended by some gold-beater's skin.

"The common anxiety which every surgeon must necessarily possess for the welfare of his patients, and those feelings of humanity, which the sad experience of the sufferings of our fellow-creatures naturally excites, will always lead to the application and removal of the pressure with due caution and tenderness."

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

Of the State of Medicine, &c. &c. in France.

BY SIR T. CHARLES MORGAN, M. D.

[From Lady Morgan's France.]

In theory, the French are, for the most part, attached to the Brunonian doctrines, which they mix up and assimilate with no inconsiderable relics of the humoral pathology. They are either wholly ignorant, or eminently fearful, of the modern practice introduced by Dr. Hamilton. It occurred to the author of these observations, to see two patients of one of the most celebrated of the Parisian physicians, who were labouring under serious and alarming symptoms of low fevers, De alvi statu nulla fuit inquisitio, ne enema quidem, consuetissimum aliàs remedium, hisce ægrotis adhibitum.

Purgantibus uti, quæ alvum acriùs movent, Parisiis, religio est; nec in officinis pharmacopolarum servatur medicamentum quod Extractum Colocynthidis audit; usque adeo in despectu est apud medicos. Quæ verò alvum lenius ducunt, nec temeré nec sine apparatu quodam adjuvantium, vel in re minime ancipiti dantur. Jusculum, manè sumptum, causa fuit, quo minus meridiè adhiberentur ægroto, quem ipse curavi.

With respect to calomel, the practice of England is ridiculed by the French, as to the last degree empirical: no authority can induce them to administer it as a cathartic in fever, nor as an alterative in many of the diseases, in which it is advantageously employed with us. In this respect, however, it would not be just to place their dislike wholly to the account of prejudice and obstinacy. The very trifling abuse of spirituous liquors which occurs in France, and the little intercourse which subsists between that country and the East and West Indies, very much exempt the inhabitants from that class of liver complaints which are so abundant in England; and which,

masked under various insidious forms, extend the efficacy of mercurials to a vast many different complications of disease. The same cause also operates to simplify fever, and to render its connexion with visceral obstruction less common and less violent. Possibly it may also contribute to preserve a greater sensibility of the intestinal canal, which may render the employment of drastic medicines less safe and less necessary.

But with every possible deduction on these accounts, it must be confessed, that the apprehensions thus entertained are excessive and unwarranted. The cutting short of fever, by the administration of a dose of calomel, followed by senna, &c. &c. forms no part of their practice, nor enters apparently into their minds as a desideratum. The theory of expectoration, indeed, which considers the febrile movements as essential to the return of health, forbids such an interference as disturbing the course of nature, and (by a strange prejudice) as originating those visceral congestions which we find to be averted by the practice in question.

The prevalence of this doctrine, conspiring with the currency of the Brunonian theory, leads also to a more sparing employment of the lancet than is usual with us. The temperance of the natives, the facility of perspiration which their climate produces, will doubtless enable them to throw off inflammation, with much less depletion than is necessary in treating the same cases in England. But from the frequency of consumption among the French, there seems to be great danger in their suffering even slight pleurisies and peripneumonies to run their natural career, when they can be cut short at once by a slight blood-letting: not to mention the protraction of the disease, and the fatigue of a long continued expectoration.

By the dread which prevails of powerful remedies, and by a strong remaining tincture of Galenical practice, there exists among the French physicians considerable confidence in drugs which English practice has consigned to oblivion, as insignificant and inert. Their patients are still drenched with pint draughts, "pour adoucir, lênifier, tempérer, et rafraichir le sang," and "pour amollir, humecter, et rafraichir les entrailles;" [to sweeten, lenify, temper, and refresh the blood, and to soften, moisten and refresh the bowels;] in the efficacy

of all which both physician and patient "most potently believe."

It is no very flattering result for the art, but it is most unquestionably true, that the proportion of deaths to recoveries in disease, is, with a very few exceptions, the same under every plan of treatment. The number of those who must inevitably die from the violence of the malady, and of those who, from the opposite cause, must necessarily recover, is so great, in comparison with that of the persons who owe their life or death to the skill or ignorance of the physician, that it is rarely possible to appreciate the merit of remedial treatment, by this test.

It was not, therefore, without much surprise, that the author of these pages found the average loss, in the Parisian hospitals, to be much greater than usually occurs in those of the British metropolis. In the report made to the French government on the charitable institutions of Paris, in the year 1808, it appears that there were received during the year 1806, into the hospital called "*La Charité*," the best, though not the most extensive in Paris, three thousand two hundred sick. Of these were

Discharged	2570
Died	386
Remained in the hospital . . .	244
	3200

The mortality, therefore, was as one to 6,67.

The *Hôtel Dieu*, on the first of January 1806, contained one thousand two hundred and seventy-four sick. The mortality on the whole number taken in during the year was, for the men, as one in 5,38, and for the women as one in 4,36.

But, in order to arrive at a greater degree of accuracy, the reporters take into consideration that many patients die on the first days of admission, whose decease is not chargeable against the practice of the hospital. On this account they state, that of one thousand and eighty-seven males deceased, five hundred and thirty-six died in the first ten days; and these being deducted, the mortality becomes reduced to one in seven; and

the same rule being applied to the deaths among the women, the average is rendered one in 5,46.

By the applications of this method to the deaths and recoveries at *La Charité*, the mortality of the men becomes one in 8,38, and that of the women one in 5,82, giving a total average of $\frac{8,38+5,82}{2}=7,10$.

The average duration of the cases, excluding those who died or left the hospital during the first ten days, was, at *L'Hôtel Dieu*, thirty-seven days; and at *La Charité* thirty days; the female cases being in both the most protracted.

The vast number of desperate accidents and of severe disease which such a city as Paris must produce, renders some deduction from the sum total of mortalities absolutely necessary for the justification of the medical practice; but in taking so long a time as ten days for the standard, in distinguishing curable from incurable maladies, there must necessarily be excluded the great majority of deaths by fever; and the physician must consequently be relieved from a greater *onus* than he is entitled to. The mortality which remains seems therefore enormous, and it greatly exceeds the average number of deaths in those even of our hospitals which are destined exclusively to the reception of fever cases. The average mortality in that fatal endemic, the Walcheren fever, where the patients had to struggle under every disadvantage of military vicissitudes and privations, did not much exceed one-tenth.

The great difference observable between the institutions of France and England, subsists also in their public charities. In England these are the fruits of individual benevolence, and are separately governed according to the will of their respective founders and contributors. In France they are under the management of the government, and are all regulated by a common police.

It is not easy to state with becoming accuracy, all the consequences resulting from each of these methods. It appears, however, that a more comprehensive view is taken of the wants of the French metropolis, and that considerable advantage results in the arrangement and distribution of the sick. On the other hand, there is a manifest inconvenience, if not

danger, in bringing the sick from the remotest part of the city to a central bureau, for the purposes of preliminary inspection.

The largest hospital in Paris is the *Hôtel Dieu*, which was designed to contain two thousand beds for constant occupation, and two hundred kept as a reserve for accidents. It does not, however, contain at present so great a number. Its situation is by no means well chosen, being in the very centre of the city; but as it is placed on an island in the middle of the river, the current of air occasioned by the stream must be favourable to ventilation. The wards are spacious, and perfectly well aired; and the patients are attended by a society of nuns of the order of St. Augustin, with the utmost humanity; and with a zeal that passed the fiery ordeal of the revolution unabated and unsullied.

La Charité contains only two hundred and thirty beds, of which one hundred and twenty are set apart for medical cases, and one hundred and four for those requiring surgical treatment.

The hospital of *St. Antoine* contained on the first of January, 1806, one hundred and seventy-two, and it received during the year two thousand two hundred and sixteen. Total mortality one in 5,74, or, with the former abatement, one in 7,42.

L'Hôpital Beaujon contained on the 1st of January 1806, ninety-eight sick, and received during the year one thousand four hundred and forty-six.

Gross mortality one in 5,96.

L'Hôpital Necker contained, at the commencement of the year, one hundred and thirty sick: received during twelve months one thousand and thirty-nine. Mortality one in 5,59.

L'Hôpital Cochin has provision for one hundred sick. Mortality in 1806, one in 6,96.

L'Hôpital de St. Louis contains nine hundred beds, and was designed to receive infectious cutaneous diseases, also scrophula and scurvy.

L'Hôpital des Venériens has five hundred beds. It received, in 1806, two thousand six hundred and sixty sick, of whom one thousand three hundred and forty were men, and one thousand three hundred and twenty women; an equality of

numbers that appears worthy of remark, if moral causes be taken into consideration. The mean duration of the cases was sixty-two days, and the mortality as one in 22,54.

Before the revolution such cases were principally taken to the *Bicetre;* but the whole number received there amounted only to six hundred annually, while that of the applicants was more than two thousand; and these are said to have formed scarcely a fourth of the number requiring assistance: for the majority were withheld by their hopelessness of obtaining admission, and by the horrible condition of the sick when admitted. Each ward contained several ranges of beds; the floors were also strewed with them; yet notwithstanding that three or four sick were sometimes placed in each bed, they were obliged to rise in the middle of the night, to make room for others to take a turn of repose. If to these considerations it be added that the names of the applicants were often placed on the list for admission eighteen months before they could be received, some notion may be formed of the sort of disease, and of the treatment which that hospital exhibited.

L'Hôpital des Enfans Malades [The Hospital for sick children] contains five hundred beds. In 1806 two thousand one hundred and sixty-one sick were admitted. The mean duration of the cases was seventy days. The mortality of the boys was one in 3,81; that of the girls one in four. They were admitted from two years to fifteen.

The lunatic hospitals are, one at Charenton, in which forty beds for men and twenty for women are maintained, at the charge of the hospitals of Paris. The Bicêtre has accommodation for above one hundred persons: at la Salpêtriere there are from seven hundred and fifty to eight hundred females: some of these are incurables; others, deemed curable, are selected from such as have not obtained admission at Charenton. They are placed in five separate departments or wards: one an hospital for incidental disease, one for incurables, one for furious maniacs, a fourth for those not dangerous, and a fifth for convalescents. The two last contain a spacious walk shaded with trees. In the practice of this hospital, which is under the superintendance of Pinel, great stress is laid upon the tepid bath, as a remedy for mania; to which is added, when the patient is

riotous, a douche [a pumping of cold water] falling several feet on the head: this practice seems to operate, not less as a moral, than as a physical remedy. Various local means are also occasionally applied, such as cauteries, leeches, blisters; but in general little reliance is placed upon the exhibition of drugs, while much confidence is placed in moral means, especially in occupation. In the physician's private room there are accumulated numerous casts of the heads of lunatics, forming a most hideous and fearful portrait of humanity. The sum total of the information which they afforded, was decidedly unfavourable to the physiognomical doctrines of Gall. Such, at least, was the opinion of Mons. Pinel on the subject; to whose politeness and urbanity the philosophic traveller, who visits this hospital, will always find himself largely indebted. To those who are unacquainted with the writings of this eminent physician, it will be consoling to know, that the utmost humanity and skill prevail in the treatment of maniacs in France: chains and whips are absolutely forbidden; and the most furious maniacs are restrained by a well-applied waistcoat. Another point also, in which morality and good feeling are cultivated, is in the seclusion of these unhappy patients. In no hospital are they made a public exhibition, to gratify the curiosity or the malignity of idle holiday-makers. Besides these hospitals, there are very many others, of a miscellaneous description. The foundling hospital, hospitals for incurable diseases, for the blind, several military hospitals, and an excellent one attached to the ecole de médicine, [the medical school,] &c. &c.; and the bureau de bénéficence [the benevolent office] distributes advice and relief to poor room-keepers at home. The funds for this charity are drawn, by an happy association, from a tax on the places of public amusement.

Besides the hospitals in which persons are gratuitously received, the delicacy of moral tact among Frenchmen has given birth to establishments, termed "maisons de santé," [houses of health,] in which those, whose fortunes have not reduced them to the necessity of receiving charity, but who are yet unequal to the expense of home attendance, may procure an apartment, the services of a nurse, physician, surgeon, and apothecary, upon the extraordinarily moderate terms of three

francs per day, paid a fortnight in advance, or of two francs only, when the invalid chooses to sleep in a common dormitory. Besides the establishment in the Rue du Faubourg St. Martin, which belongs to the government of the bureau de bénéficence, there are others belonging to individuals, who apparently render these institutions a mean of introduction to general practice. It may very well be doubted whether establishments like these could be introduced into England, where provisions are so expensive, and where civility, and the numberless inexpressible attentions which the sick require, must be purchased of the nurse by clandestine gratuities, and where there subsists so large a portion of petty pride and ostentation, to prevent small tradesmen and room-keepers from accepting an advantage which would so publicly mark their circumstances in life. The spirit, however, in which the maisons de santé are conceived, might be adopted at home with the benefit to the national character, to counteract the depressing influence of that system, which has placed nearly a quarter of the male population upon the parish lists, and bowed down the "bold peasantry, their country's pride," to pauperism and servility.

In the general management of the French hospitals, all the advantages of order and arrangement are attained, which might be expected from the military precision that the revolution has introduced into every branch of the public service. By six o'clock in the morning, nurse, physicians, surgeons, and pupils are assembled; and before twelve every patient is visited; half a dozen or more great operations, perhaps, performed; clinical lectures given, and advice administered to a crowd of external patients. The advantages resulting from these early hours, are, first, that the diet for the day is directed according to the actual wants of the patients; while in hospitals where this regulation does not subsist, any changes which the physician may make in the food and drink of the sick, can only be put into execution on the following day, when their situation and necessities may become very different. There is, besides, a great increase of comfort to those, whose wounds, &c. require dressing, and who are thus at an earlier hour put at rest for the remainder of the day. But the principal benefit which ensues from this practice, is in the case of great operations.

Very often in the English hospitals, a patient knows that he is condemned to an amputation, &c. &c. for some days before it is to take place: by operating every day, this interval is, in France, not extended beyond four and twenty hours; and by the early attendance of the surgeons, the immediate expectation is much diminished. It is in human nature so contrived, that those events which are separated by the death of each day's life, do not impress the mind so strongly as those which are to be performed in the current day: the agony of expectation, therefore, in these cases, is the most distressing from the period of waking in the morning, until the hour at which the operation is to be performed. During this time, every moment is counted; and the arrival of the surgeon is alternately desired and deprecated, as patience or apprehension assume the control; and thus, much of that courage which should be reserved for the moment of suffering, is expended in horrible anticipations, and unavailing regret. There can be no hesitation as to the propriety of adopting, in our English hospitals, this merciful custom of early attendance.

In the conduct of their operations, and, indeed, in their general intercourse with the sick, the French medical men are tender and kind-hearted; and at once an honour to their profession and to human nature. Their address is soothing, consolatory, eminently calculated to win confidence, and to quiet alarm. In action, they are prompt, dexterous and alert. Every thing is previously calculated, and every step of the process clearly foreseen and arranged in the mind, before any part of it is commenced. No time is thus spent in previous handling of the part; no interval is allowed to elapse between the different stages of the operation. After a moment's self concentration, the surgeon approaches the patient with some cheering and encouraging observation: he takes the knife; the incisions are made; the saw is instantly handed; the assistant is ready with his ligatures; the arteries are tied; and the wound closed in the shortest possible interval. The utmost silence and decorum are observed by the pupils during the whole time; and thus, both the moral and physical suffering attendant upon these horrible necessities of humanity, are reduced nearly to an absolute minimum. In all these particulars, the constitu-

tional kindness of the French character, the activity of their sympathies, and the warmth of their feelings, display themselves to the greatest advantage. There is no cant of sentimentality, no insincerity of compliment; their virtues are exhibited in positive result; and let those who are virulent in their abuse of the national character, blush, when they talk of degraded morals and egotistical indifference.

Of the medical education in France, there has been already occasion to speak with praise: the subject is peculiarly interesting at the present moment, from the disputes to which it has given occasion in our country,

There are in France three Universities, having power to confer medical degrees; that of Paris, of Montpellier, and of Strasbourg; and the graduates of these places are at liberty to practise in Paris, or elsewhere in France, upon registering their names at the municipality of the arrondissement; a formality which is, however, often neglected, without drawing any serious consequences on the offender.

The different ranks acknowledged in practice, are those of doctor of medicine, doctor of surgery, and *officier de santè* (a rank answering somewhat to that of surgeon apothecary in London,) and lastly that of apothecary, whose functions are strictly confined to the compounding of drugs.

Before the establishment of this order, the practice of physic, like every other institution, had fallen into excessive abuses. The picture which the reporters of the new law have drawn, is sufficiently similar to that which might be sketched of the present state of practice in England, to warrant a short extract. They state that, "in spite of the apparent order which subsisted, time had introduced abuses and irregularities, against which all persons of intelligence had exclaimed for the last thirty years. Such particularly were the difference of qualifications for doctors, *intrà muros et extra muros;* the differences of privileges of bachelors, licentiates, regent, and non-regent doctors. Opposed to some advantages, were to be seen the passions and jealousies assuming the pretext of order, and the dignity of the profession, to torment those, who, either by novelty of doctrine or successful practice, had arisen to distinction and notoriety. Its two universities (those of Paris and

of Montpellier) preserved the severity and dignity of their examinations; all the others nearly had become culpably facile in their admissions, so that the title of doctor was conferred on absentees, and letters of reception were expedited by the post." To remedy these evils, the three universities were, by a law, equalized both as to privileges and to qualifications, and a degree from either is now alike available in all parts of the empire. There exist, therefore, in France, no corporate bodies, independent of the universities, to regulate locally or generally, the practice of physic; and infringements of the law are pursued, like any other penal offences, by the officers of the police. The time of study requisite for obtaining a doctor's degree in physic or surgery, is four years; the examinations to be passed, are one in anatomy and physiology, a second in pathology and nosology, a third in materia medica, chemistry and pharmacy, a fourth in *l'hygiène* and forensic medicine, and a fifth on internal or external clinical examination, according as the candidate determines for physic or surgery. These examinations are public, and two of them are directed to be held in Latin. After they have passed, the candidate has yet to write and to maintain others, either in French or Latin. The whole expense of study and for the degree is fixed at a maximum of one thousand francs, about forty pounds.

The qualifications for an *officier de santè* are six years' study under a doctor, or five years' attendance on the practice of a civil or military hospital; or lastly, three years passed in a school of medicine. He is examined by a jury composed of two physicians, domiciliated in the department, and a *commissaire*, who is taken from among the professors of the several schools of medicine: this jury assembles once a year. The examinations are three; one in anatomy, one on the elements of medicine, and the third in surgery and the most common parts of pharmacy. The whole expense is limited to two hundred francs. The duty of these persons is defined, by the reporters of the law, to be the general care of the sick, in remote country places, and the superintendence every where of such slight diseases as do not require the advice of the physician or surgeon.

Very particular pains seem to have been taken, respecting

the education of apothecaries. Courses of botany, natural history, chemistry, &c. are directed to be given in the schools of pharmacy; and no one is suffered to practise, without being first examined, either in the schools, or before a departmental jury. The examinations are, one on natural history, one on the theory of pharmacy, and another on its manipulations and processes. The last of these examinations must last for four days, and must consist of, at least, nine chemical or pharmaceutic operations, in which the candidate is to describe his materials, to explain his method of procedure, and declare the nature of their expected results. The candidate must be twenty-five years of age. The expense of his examination, in the schools, is fixed at nine hundred francs; or before the jury, at two hundred.

Officiers de santè, where there are no apothecaries, may supply their own patients with medicine, but they are not permitted to keep open shop. Apothecaries' shops are subject to visitation, by the professors of the schools of medicine, within a circuit of ten leagues from the place in which they are held. In all other places, this duty is performed by the jury of physicians.

The sale of quack medicines is utterly forbidden; and druggists are subject to a penalty of five hundred francs, if they presume to compound medicines. Both druggists and apothecaries are bound, under a heavy penalty, to keep a book, in which the names, residence, &c. are inserted, of all persons to whom they shall sell poisonous drugs; as also the nature of the drug, and the usage for which it is intended.

In the instruction of midwives, it is directed that an annual and gratuitous course of midwifery be given, in the largest hospital of the department. Before any person can be admitted to an examination, she must have attended two courses of lectures, have been present for nine months at deliveries, or have operated herself in the hospital, for six months. Women are not allowed to deliver with instruments, unless sanctioned by the presence of a physician or surgeon.

Such are the principal enactments of the law, which regulates the practice of physic. As far as could be gathered from general inquiries, it appears that the doctors in the two facul-

ties practise indifferently in each, without jealousy and without disagreement; and that even persons, having no legal title, practise in Paris, &c. without drawing upon themselves the infliction of the appointed penalty.

Apothecaries universally prescribe for the poor, and for such persons as ask their advice in their shops. The advertisements of quacks also figure upon the columns of the *Palais Royal*, no less than upon the walls of the Royal Exchange, in London. The new institutions of medical police in France are not therefore more effectual in regulating the practice of physic, than the obsolete enactments of the English law. It should seem that the most which can be effected by such legislative interference, is a general influence upon the profession; and that great forbearance and indulgence must ever be granted to individuals. For it is in the natural order of things, that society should break through the artificial distinction of ranks created in colleges and academies; and that having the purse in its own hands, it should distribute its favours wherever caprice or judgment directs. There ever must exist some few apothecaries, better skilled to practise physic than the ordinary mass of *routine* physicians; for genius is not confined to any rank: surgeons likewise will often be found, the bent of whose ability lies rather towards physic than surgery, and it is a manifest injury to society, and an injustice towards individuals, to deprive such persons of the exercise of their peculiar talent. It is besides a natural and an inevitable consequence, that mothers, indebted for their own and their children's lives, to the skill of an *accoucheur*, should extend their confidence in him through the other branches of the art, and call upon him to attend in the general diseases of the family; nor can any penal statute prevent her from preferring a tried friend, to making a confidence of the secrets of her family to a stranger. The poorer class of persons also will always apply for the cheapest advice, and will seek it among the compounders of medicine; notwithstanding any statute that may be made to the contrary. The apothecary will, indeed, be the small shopkeeper's physician, not more on the score of expense, than on account of the distance which education and habits of life place between such persons and the graduated doctors.

Two great difficulties oppose themselves to any regulation susceptible of a rigid practical adoption. Either other qualifications must be expected, than mere examinations, or that test must be taken alone. In the first case, individuals entitled by their knowledge to practise, will be excluded, when their fortunes have placed them out of the reach of university instructions; a decision with which the public will never comply. In the second, the entire object of legislative interference will be defeated, since no test is more undecisive or more capable of evasion, than the power of answering a few questions; a power which may be acquired by the short and summary method, well known to those whom it may concern, under the technical appellation of *grinding*. It should therefore become an established principle with all corporate bodies, to administer their powers according to the spirit of their institution, and not in the dead letter of monopoly; for, in proportion as their utility is circumscribed, individual oppression becomes offensive and intolerable.

From the whole that could be gathered from inquiries, not always very directly answered, the medical police, as far as it concerns the regulation of practice, seems to have become in Paris, a dead letter, without producing many cases of flagrant imposition, or exciting any jealousies or ill-will among the practitioners.

The school of physic in Paris is numerously attended. The faculty are in possession of a building of great convenience, and of beautiful architecture. But its amphitheatres, though of immense size, are not larger than is necessary for containing the crowded audiences, which consist not only of medical students, but persons attracted by the general love of knowledge. During the continuance of war, the demand for surgeons alone maintained a numerous class in the schools. Cuvier, in a desultory conversation with which he honoured the author of these sheets, stated the annual consumption of medical officers under Napoleon, at an average of five hundred.

The faculty of physic possess an extensive and valuable library, like all other Parisian libraries, of most easy access and much frequented. They have also a collection of preparations, inferior in many respects to those of the anatomy schools in

London; a collection of surgical instruments, and another of models. These last are beautifully executed, and represent recent dissections with a perfection, which no art can preserve in the parts themselves.

The faculty assemble at certain intervals, to read papers and to discuss practical points; for which purpose the members also bring patients for illustration and for example. At the sitting at which the author was present, a member exhibited some cases of very extensive suppurating tumours, which were absorbed and dissipated by the repeated application of the *moxa.* One of these tumours had occupied the whole of one side of the back, and must, from the appearance of the part, have contained nearly half a gallon of fluid. In the same sitting a paper was read recommending the exhibition of large doses of opium in cholera: the difference in the state of French physic and of surgery could scarcely be better illustrated.

Though abounding with scientific journals, France is not possessed of any periodical work on the healing arts, comparable with the Edinburgh Medical Journal, or the transactions of the London Medico-Chirurgical Society. The practice of giving detached observations to the public has not yet commenced in France, or is confined exclusively to the verbal communications made at the Institute, and other learned societies. Individual vanity has not taken this route to gratification, and authorship in general is not made a professional stepping stone, but is confined to a few individuals, who rarely deign to make their appearance in a less imposing manner, than by an entire system, or in a smaller shape, than a series of comely octavos. The practice also of the country *officiers de santè*, &c. is in all probability, too closely subjected to the law and the gospel of authority, to admit of those novelties, which pour in from all parts of the British dominions, upon the editors of periodical works; and which, if they subject the reader to the task of wading through much nonsense, still contain, among the chaff, a considerable portion of valuable grain, which, if not thus gleaned, would be lost to the service of humanity.

The "Bibliothéque Médicale" [the Medical Library,] consists entirely of extracts from published works and criticism.

The "Journal Général de Médicine," [the Journal General of Medicine,] commenced by Corvisart, Boyer, and Roux, has passed into other hands.

The "Journal Universel des Sciences Médicales" [the Journal Universal of the Medical Sciences,] is an entire new work, and has yet its reputation to establish.

"La Gazette de Santè" [the Gazette of Health,] is a single sheet, published every ten days, containing principally facts, with but a small portion of critical matter. It is valuable for its list of the cases, which are from time to time admitted into the hospitals of Paris; and it contains also a series of articles upon the history of medical opinions. This work is edited by Dr. Montégre, a gentleman of great talent, information, and zeal for science; and it is conducted in a spirit purely philosophical. Of these works, some have been recently silenced, by the operation of the new stamp duty, *usque adeo obtusa*, &c. Such is the spirit of the present government.

It has been the fate of physic, from the very first revival of letters, to creep slowly behind the other sciences, and to adopt their methods only at considerable intervals after their establishment and success. This has arisen partly perhaps from the culpable influence of authority, and partly also, from a laudable hesitation at innovating, where so great an interest is at stake. This remark will explain the present state of the science in France, which is still very greatly in arrear of its associate arts; and is commencing only that career, in which the other natural sciences have made such considerable progress. There is, however, good cause to believe, that the impetus which it has received, will lead to speedy and important improvements, and that the spirit of Bichat, Gaulois, and Majendie, will be carried to practical discussions. To the habit of observation, on which the French physicians so justly pride themselves, there will then be added a greater degree of enterprise in the employment of curative means, and thus they will become entitled to take a lead in forming the medical opinions of Europe; and will have weight enough to induce our own countrymen to set bounds to their empirical tendencies, if, as the French suppose, they are indeed verging to a vi-

cious excess, and tend to a partial degradation of the science itself.

At the time when the father of physic wrote, the observation of symptoms was the only road open to investigation. Chemistry, anatomy, physiology, did not exist, nor had natural philosophy explained any of the external causes which generate disease. But the leading reason which impelled Hippocrates into his peculiar line of inquiry, was the almost entire want of all really powerful remedies. Without bark, mercury, antimony, and opium, his means of operating upon disease were limited within very narrow bounds. His functions, as a physician, were reduced nearly to a vain and useless augury, while his views, as a philosopher, were necessarily directed to the subject itself, for the means of curing disease, by his ignorance of the resources of the external world. The present state of knowledge justifies and demands a different line of inquiry. It is no longer sufficient to know the disease; the physician must cure it. He must wield with courage and dexterity the weighty weapons, which modern discoveries have placed in his hands; and in this branch the French have yet much to learn. Their literature is eminently deficient in those monographic works, which in England have so powerfully contributed to the progress of medicine; and it is absolutely without names, to place in the same line of those of Hamilton, Currie, Saunders, Pemberton, Blackall and Watts. They have, however, but a small barrier to pass, a few prejudices to cast aside, and the zeal with which natural science is so universally pursued, will lead them rapidly forward in the right path. In the mean while it is to be hoped, that the horrible and barbarous system of insulation and seclusion, which for thirty years has cramped the energies and checked the progress of the sciences, will give place to a peaceful intercourse between nations: or, at least, that war will be conducted upon a more humanized plan. Whatever may be the political relations of independent states, it belongs to the illumination of the present age to determine, that the lettered and scientific world shall be considered as universally at peace; that it shall at all times be permitted by a freedom of intercourse and a liberal interchange of knowledge, to promote the great work

of human happiness; and, like pity, following in the train of slaughter, to heal up those wounds which the madness of ambition inflicts on the prosperity and civilization of the European republic.

Further improvement in Professor Leslie's method of producing Ice.

[From the Annals of Philosophy, for July 1817.]

TO DR. THOMSON.

DEAR SIR,

I think it worth while to mention in this stage of my experiments, that *parched oatmeal* has a stronger and more extensive power of absorbing humidity than even the decayed trap rock.

With about three quarters of a pound of meal, occupying a surface of seven inches in diameter, I froze nearly a quarter of a pound of water, and kept it for the space of twenty hours in the form of ice, till one half of the congealed mass was again melted.

The temperature of the room being nearly fifty degrees, the meal had then absorbed the eighteenth part of its weight, though it had not yet lost more than one third of its desiccating power.

With a body of dried oatmeal a foot in diameter and rather more than an inch deep, I have since frozen a pound and a quarter of water, contained in a hemispherical porous cup; and though the room is warmer than before, the energy of absorption seems to be capable of maintaining the state of congelation for a considerable time.

It is curious to observe, that when the experiment was reversed, and the surface of the water about double that of the meal, this substance acquired, after the air under the receiver had been rarified, a heat exceeding fifty degrees of Fahrenheit, so as to feel indeed sensibly hot on applying the hand.

I am, dear sir, sincerely yours,

JOHN LESLIE.

Surgical Institution at Baltimore.

The subscribers announce to the public that, authorised by the State Legislature, they have established, upon an extensive scale, a *Surgical Institution* for the reception of Patients requiring surgical aid, and that they are now ready to accommodate a considerable number.

The buildings appropriated to the purpose are spacious and commodious, a short distance from town, and situated in an elevated and remarkably healthy part of the country. Patients may be accommodated in the different buildings, according to their different situations in life, and with as much comfort and convenience as if lodged in their own house.

It is intended to receive in the Institution every description of Surgical disease, and to exclude all febrile and other diseases, capable of imparting contagion or infecting the atmosphere, as well as all maniacal and convulsive diseases. A particular part of the Institution will be allotted to the diseases of the eye and ear, and for the various operations which it is sometimes necessary to perform.

The subscribers have appointed, as superintendants of the institution, a Steward and Matron, who from their long experience in these departments, and accommodating dispositions, are eminently qualified to render the sick comfortable and to afford general satisfaction.

Two roads lead to the Institution, one by the Falls Turnpike, the other by Madison street extended—the particular spot is designated by finger posts.

Wm. Gibson, Surgeon.
Jno. Owen, Physician.

Obituary notice of Dr. Kuhn.

Died, on Saturday evening, July 5th, 1817, aged 76 years, Dr. Adam Kuhn, an eminent physician. Dr. Kuhn was a native of Lancaster in this state, and after passing through the first studies preparatory for his profession, he passed to Europe, and visited the most celebrated medical institutions. He spent several years as a student of the celebrated naturalist Linnæus at Upsal in Sweden, and having profited by the

knowledge of the ablest men of that period in Europe, nearly fifty years ago sat down in the capital of his native state, where he held a professor's chair in one branch or another for many years, and continued in the most successful practice of his profession; until within the three or four last years, he gradually retired from professional pursuits. As a husband, parent, and friend, his life was unostentatious and exemplary —as a physician, no man's reputation stood higher. His descendants having reached maturity, he had fulfilled his duties, and knowing them to be all happy, he parted with life without regret and without pain, calm and collected, and himself indicating the moment when he was to speak no more.

Death of Dr. Odier.

Dr. Odier, professor of medicine at Geneva and fellow of various learned societies, died at Geneva on April 14th, of an angina pectoris, at the age of 69. His long and very extensive practice, his various works, all of them highly esteemed, and his different courses of lectures, have established his reputation.

His death has occasioned the most lively regret.

The public loses in him, not only a skilful physician, but a zealous citizen, always ready to perform the painful and gratuitous functions to which he was called, and for which he was adapted by his talents, his knowledge, and his uncommon skill. His character and the sweetness of his temper rendered him dear to society. His family and friends are inconsolable for his loss.—*Annals of Philosophy*, *June* 1817.

The insertion of several original papers, has been unexpectedly omitted in the present number.

LIST OF RECENT EUROPEAN PUBLICATIONS.

Botany.

Flora Anomala; a general view of the Anomalies in the Vegetable Kingdom. By Thomas Hopkirk, younger, of Dalboth, with engravings.

Green's Botanical Dictionary, or Universal Herbal, Pt. IV.

Pomona Britannica. By George Brookshaw, Pt. X. royal 4to.

Medicine, Surgery, and Anatomy.

The Edinburgh Medical and Surgical Journal, No. 50.

The Annals of Medicine and Surgery, or Records of occurring Improvements and Discoveries in Medicine and Surgery; and the immediately connected Arts and Sciences, Part IV.

An Essay on Burns, in two parts; principally on those which happen to Workmen in Mines, &c. &c. By Edward Kentish, M. D. Physician to the Bristol Dispensary.

An Epitome of Juridical or Forensic Medicine. By George Edward Male, M. D.

Considerations on the Moral Management of Insane Persons. By J. Haslam, M. D.

A cursory Inquiry into some of the principal causes of Mortality among Children.

Suggestions for the prevention and mitigation of Epidemic and Pestilential Diseases. By Charles Maclean, M. D.

An Examination of the Objections made in Britain against the Doctrines of Gall and Spurzheim. By J. G. Spurzheim, M. D.

The Medical Guardian of Youth. By Robert John Thornton, M. D. &c.

Orfila's Toxicology, Vol. 2. Pt. 2.

Surgical Observations; being a Quarterly Report of Cases in Surgery, treated in the Middlesex Hospital, &c. &c. By C. Bell, Esq. Part III.

Natural History.

A new edition of Outlines of Mineralogy and Geology; to which is added an Outline of the Geology of England and

Wales, with a Map and Section of the Strata. By William Phillips.

An Introduction to Entomology, or Elements of the Natural History of Insects. By the Rev. William Kirby, B. A. F. L. S. and William Spence, Esq. F. L. S. vol. 2, with coloured engravings.

Scientific Books in hand, or in the press.

Dr. Scudamore is printing an enlarged edition of his Treatise on the nature of Gout and Rheumatism.

Mr. C. C. Bompas is about to publish an Essay on Light, Heat, and Electricity.

A translation of Orfila's Treatise on Chemistry is about to be published.

Dr. Marshall Hall will shortly publish the Principles of Diagnosis founded entirely on the external appearances of diseases.

A sketch of the history and cure of Febrile Diseases, particuarly those of the West-Indies, by Dr. Robert Jackson.

Annals of Philosophy, July 1817.

M. Carey & Son have in the press, and will speedily publish, an abridgment of Orfila's Toxicology, or general treatise on poisons, considered in their relations with physiology, pathology, and medical jurisprudence, by Jos. G. Nancrede, M. D., in one volume 8vo. This work, which was originally published in French, in two octavo volumes, has been reduced to what was deemed absolutely useful to the medical practitioner.

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